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THE GLEANINGS IN THE BEEHIVE

A JOURNAL DEVOTED TO BEES, AND HONEY, AND HOME INTERESTS.

ILLUSTRATED SEMI-MONTHLY
PUBLISHED BY A. I. Root.
\$1.00 PER YEAR MEDINA OHIO

Vol. XXII.

FEB. 15, 1894.

No. 4.

STRAY STRAWS

FROM DR. C. C. MILLER.

ONLY two weeks more of winter.

THAT PLAN on p. 99, of giving a page of reports in 2 inches of space, is capital.

EDITOR YORK has one requisite toward getting up a good paper—a happy home. I sampled it lately, so I know.

SORGHUM was fed by N. E. Cleveland, Miss., to 5 colonies in October. Dec. 23 four were dead and the fifth nearly gone.

W. B. WEBSTER, a prominent writer in the *B. B. J.*, claims that cross bees, as a rule, are not as good workers as gentle ones.

ILLINOIS didn't do a big thing in honey last year. The average of reports made at State convention was 8 lbs. per colony.

ARE WILD CUCUMBERS of several kinds? On p. 90 you speak of "the original vine." They are plentiful in this region, but annuals.

BEES PREPARED for winter Sept. 1 show up better and stronger in spring than those prepared Oct. 1, says W. Woodley in *British B. J.*

GERMAN BEE-KEEPERS are protesting against a law that prohibits the temporary placing of hives within two miles of permanent apiaries.

SPECIAL-TOPIC numbers seem on the increase among bee-journals. The *Canadian* starts it under the name of "Bee-keepers' Parliament."

THE BRITISH "standard" frame is 14 x 8½. Seven such about equal five *Simplicities*. The square Gallup is a little larger than the British.

ST. JOE is the name of a hive two of my friends have sent me circulars about. Won't the chap that named that hive catch it if Bro. Abbott, of Saint Joseph, gets after him?

HERR REEPEN crows—and well he may—that the oldest bee-book in the world is in German. It is "Der Bienbock," Thomas Cantibratensis, 1448, and is owned by F. H. Wytopil, Vienna, and cost \$55. I think no bee-book was published in this country till after 1492.

KEEP STILL, by all means, about adulteration; at least, don't let any thing about it get into print, if you want to please—the adulterators.

FOREIGN COMPETITION is just now a topic of interest in England, and the suggestion is offered that "steps must be taken in a body" against foreign honey now sold at cts. a pound.

THE BRITISH *B. J.* characterizes syrup-feeding to increase the yield of surplus as "a nefarious and dishonest practice, calculated to do serious harm to an otherwise legitimate and delightful pursuit."

BRACE-COMBS are caused, according to E. J. Cronkleton, in *A. B. J.*, by loose swinging combs. The bees feel their shaking, and fail to work to brace up. But it doesn't seem that a bee's step ought to jar much.

HILL DEVICE improved. Place two wood separators of proper length, about an inch apart; bow them up in the middle, and stick the ends down on the inside of the hive at both sides.—*Marion Miller, in Progressive.*

EIGHT-FRAME HIVES are preferred by comb-honey men, almost without exception. How many have proved, by a fair and square trial of 8 frames, side by side with 10 frames, which was better? I commend this to experimenter Taylor.

A STUBBORN COLONY can be made to swarm, according to an item in *Centralblatt*, by hanging a caged virgin queen between the combs. The old queen gets out. Now tell us what to hang between the combs so the other colonies won't swarm.

THE DZIERZON THEORY occasioned a bitter war of words about 50 years ago. After holding undisputed sway for years, it has again become a bone of contention—Reepen, Schœnfeld, and others, defending it against no less an opponent than Dzierzon himself!

SOME SAY HONEY extracted from the brood-chamber can't be as good as from a super. There may be more floating pollen in the brood-chamber, and an occasional larva thrown out brings with it the larval food, thus spoiling the flavor as well as bringing on fermentation.

WILDER GRAHAME's advice, to raise regular patches of white clover convenient to a large apiary to keep bees busy and keep out other honey, is Wilder advice than often gets into GLEANINGS. How large a patch, and how convenient to a large apiary, to accomplish the object?

AN OCTOGENARIAN in Germany ascribes much of his good health to drinking *honey tea*—a table-spoonful of best honey in a teacup of boiling water. I've tried it a good many times, and find it a refreshing drink. You may or may not like it. For convenience, keep some honey thinned in advance.

THE BRITISH BEE JOURNAL says that, Jan. 5, in the suburbs of London, the thermometer marked 10° above zero, "a lower point than it has done for many a year." When I read that, I went in my shirt-sleeves to look at my thermometer, and found it 25 degrees lower, in the middle of a bright sunshiny day.

WASPS are troublesome across the water, but not on this side, as I mentioned in a former Straw. Herr Reepen replies that our troublesome skunks are unknown there. But he sha'n't have the last word, and I rise to tell him we're not so cruel to children as they are in Germany. Just think of making little children use a language that floors an old chap like me!

A FEW YEARS ago there were hundreds of small cabinet-shops scattered over the country, making furniture by hand or with light power, but they have all disappeared, so far as manufacturing is concerned. The large factories are doing it all, and we now get better and cheaper furniture. I predict the same future for the bee-supply trade.—*M. H. Hunt, at Mich. Convention.*



Our Symposium on Bees and Fruit.

Valuable Testimony Supporting the Bee.

A Lively Discussion, Pro and Con.

We will first let those on the negative side give their arguments. These will then be followed by those on the affirmative.—*Ed.*

BEES NOT NECESSARY TO THE PROPER FERTILIZATION OF FRUIT-BLOOM.

By W. S. Fultz.

In studying this question I have tried to do so in an unprejudiced manner, being both a bee-keeper and fruit-grower. I have looked at it from both standpoints. Why all bee-keepers, in trying to discuss this question, always merge it into that of spraying and the destruction of

fruit by bees, is more than I can understand. There seems to be such a strong undercurrent of feeling among them all in that direction, it naturally leads the public to believe that they have an ax to grind, and that they seek every opportunity to get it on the grindstone.

As a fruit-grower I have my own ideas of those other questions; and my experience of 20 years in the business, with an apiary on the same farm, has enabled me to decide those questions to my own satisfaction; but I do not think they have any bearing on the subject under discussion, and shall ignore them entirely. With me, in discussing this question, there is no "negro in the woodpile."

I now wish to draw attention to your editorial on page 61, in which you say that my arguments are based largely on negative testimony, and that Prof. Cook and the rest rely upon positive facts and figures. In my article I gave several instances where I had observed good crops raised without the aid of bees. If that is not positive evidence that crops can be so raised, then I must plead being ignorant as to what positive evidence is.

[Your evidence on this point is negative, because you produce no proof that the crop in question would not have been better by having bees. If for ten years *without* the bees your crops were good, and for ten years *with* the bees the crops were smaller and poorer, you would have evidence of positive character against the bee.—*Ed.*]

With regard to the experiments of Prof. Cook, Mr. Gilliland, and the others to whom you refer, I must say that, in my opinion, all such evidence is negative, or, rather, it is no evidence at all. When Prof. Cook and the others placed cheese-cloth or netting over the bloom with which they were experimenting they interfered with nature's methods of fertilization. I would almost as soon shut up a female hog in a latticed pen, where she would be kept entirely from all contact with her kind, and expect her to be fruitful and multiply, as to expect a fruit-bloom to become fertilized under the same conditions. Nature intended that a contact should take place to make that bloom fruitful; and Prof. Cook, and the others to whom you refer, covered those flowers and shut off nature's methods, and then asserted that, because the bees could not get to the flowers to fertilize them, they proved barren or nearly so. Had those flowers that were experimented with not been covered, so that nature could have performed her functions, it is safe to say that they would have been properly fertilized, even if no honey-bee had ever been near them.

[Your illustration of the hog in the pen is not a parallel case. Most fruit-blossoms will fertilize themselves to a large extent, but there is no self-fertilization in the animal kingdom.—*Ed.*]

Some other means must be resorted to, when making those experiments, than covering the bloom, otherwise all results will be negative. Any well-posted horticulturist could have told Prof. Cook what the probable results would be, at the commencement of his experiments, for

they were just what might have been expected. The bloom operated upon was probably staminate, and produced pollen, and, as a natural consequence, became self-fertilized, and the result was an inferior product. I do not care to follow or analyze the article of Prof. Cook; his arguments and conclusions are all based on the same kind of experiments, and, as a consequence, are all of a negative nature, and of no force whatever.

Now, Mr. Editor, let us get at the gist of this question. In the article sent you by Mr. Doolittle, I simply made the assertion that the aid of honey-bees was not needed in the proper fertilization of fruit-bloom. Now I am going to make the broader assertion, that fertilization is not aided to any extent by them. This assertion is based on the fact that no horticulturist, however expert he may be in the art of artificial fertilization, can take the pollen from a honey-bee, and, without changing its condition, successfully fertilize a fruit-blossom. If an expert horticulturist can not do this, then how can a bee do it? The horticulturist's object is to fertilize; the bee's object is to gather the pollen and honey, and carry it to the hive. The instinct of the bee does not teach it how to prepare pollen for fertilization purposes. Man's knowledge and ingenuity do, and man can take the pollen from a bee, and, after properly preparing it, make it successful in fertilizing.

It would be an easy matter to test this thing. Let three or more persons in widely separated localities cover at least 100 fruit-blossoms (apple being the most plentiful would be preferred), in the same manner as was done by Prof. Cook and others. This should be done before the flowers were fully opened; then when they are open take a small pair of scissors and remove the stamens, so that self-fertilization can not take place, replacing the covers immediately, and let them remain until the pistil of the flowers are in a receptive condition, and then take pollen from honey-bees that are gathering it from the same kind of trees, and try to fertilize the covered bloom with it, just as it is taken from the bees. If such experiments are successful, then bees can assist in fertilizing fruit-bloom; but if they are a failure, as I am well satisfied they will be, then the claim that they do assist is not well founded, and should be dropped by the bee-keeping fraternity.

Wet or even damp pollen, as has been demonstrated by experiment, is not potent, and will not perform its intended function. This accounts for the fact that, when we have wet weather during fruit-bloom, we get no crop. The pistil of the flowers pass beyond their receptive state during the time that the pollen remains impotent; consequently no fertilization can take place that season.

Muscataine, Ia., Jan. 22.

[In view of the *bulk* of the testimony to the

contrary appearing in this number, it is rather a strong statement to say that "fertilization is not to any extent aided" by the bees. As to the other points in your article, honest investigation courts fair criticism.—Ed.]

BEEES AND FRUIT ON THE ISLANDS OF LAKE ERIE.

By Thaddeus Smith.

We ought to be able to get a satisfactory answer to this question by bringing together the facts about it, and looking at these facts with an unprejudiced mind, not committed to any particular theory, and not biased by self-interest. I have been a bee-keeper for over forty years, and I am also a fruit-grower, and I think I can look at both sides of the question in an impartial manner. I will say here, that I have changed my views about this matter, as I have done with some other cherished views of bee culture that I was taught and have taught others.

I live upon an island; and when I came here 25 years ago there were but two colonies of bees here. These I bought and immediately Italianized, and engaged in raising queens, as there were no black bees here to mix with them. The fruit here 25 years ago was more certain, and less affected by disease, than it has been for several years just past. The bees have increased to 100 or more colonies, and have been distributed to various parts of the island. Shall I say the increase of bees is the cause of the decrease of quantity and quality of fruit? No, far from it. But such is the kind of argument used by some on the affirmative of this question.

Not very long ago I read a communication to one of our bee-papers, stating that the writer had put some stands of bees in *one corner* of his garden, or yard, and that the fruit-trees in that part of the garden had given a good crop of fruit, while the trees in the other corner of the garden had failed in fruit. This statement was given to show what a great advantage bees were in fertilizing bloom. Will any intelligent bee-keeper accept this experiment as a knock-down argument?

I have never met Prof. Cook; but from his writings and character I have learned to esteem him very highly. In fact, I have been almost ready, as the saying is, to swear by any thing that Prof. Cook would say. But in the article republished in GLEANINGS he has certainly deduced some unwarrantable conclusions from some facts stated. For instance, he says: "I have often noticed the fact, that, if we have rain and cold all during the fruit-bloom, even trees that bloom fully are almost sure to bear sparingly." This is accounted for by Prof. Cook, solely because it was too cold for the bees to fly. But is there not a much better reason to account for this failure to fruit? Every fruit-grower knows that these cold rains fill

the bloom with water, and sometimes ice, and is as destructive to the embryo fruit as a heavy frost. This damp cold weather would also prevent pollen from being carried about by the wind. Again, Prof. C. covered some fruit-blooms with *cheese-cloth*, and the result was they were not fertilized as well as those left uncovered. Any one would have naturally expected this, as this cheese-cloth would certainly keep off the pollen floated about by the wind. Did he or any one else see the bees visit those uncovered blossoms? If not, why make such a positive statement that the bees were the sole cause of their fertilization?

But it is not my intention to criticise the articles in GLEANINGS, but to give some facts bearing upon the subject. Within ten miles of me there is a tight little island in Lake Erie where no bees are kept; and it is so far from main land, and other places where bees are kept, that bees never visit it. This island is almost entirely used for fruit-growing, and a success is made of it. But the editor of GLEANINGS says, "That fruit has grown where no bees were known, *proves nothing*." Let's see. I have a friend on this same island devoted to growing fine fruit; and his fruit, whether of apples, pears, plums, or cherries, or his especial pride, strawberries and raspberries, can not be grown to any greater perfection upon any land of the same quality in the State of Ohio, though there were 100 stands of bees in the "corner of the garden." But this may "prove nothing," except the old adage,

Convince a man against his will,
He's of the same opinion still.

It may be said that, in the absence of bees, other insects may have fertilized the fruit-bloom. Well, if other insects fertilize the bloom so perfectly, why say that *bees are necessary* to do it? But Prof. Cook shows the improbability of the other insect theory. He says, in the same article quoted before, "Early in the season in our northern latitude most insects are scarce. The severe winters so thin their numbers that we find barely one; whereas we can find hundreds in late summer," etc., showing conclusively that the fine fruit of this place was not owing to insect fertilization.

And now for the "bumble-bee." Every one will admit that it is a *hum-bug*; and I think this red-clover-seed theory connected with it is the biggest kind of a humbug. There are but few bumble-bees on this island, some seasons scarcely any. For every single bumble-bee here, I believe there are ten thousand, and, I might safely say, ten million clover-heads. In a favorable season, red clover makes a fine yield of seed here. It would simply be impossible for the bumble-bees to visit all the heads containing seed.

Pelée Island, Ont.

[Perhaps some unwarranted conclusions have

been drawn by both sides; if so, let's have the fallacies shown up. While you are peculiarly well situated for getting facts, some of *your* conclusions will not stand the closest scrutiny. For instance, you say you have a friend, a fruit-grower, on an island where no bees exist, whose fruit "can not be grown to any greater perfection upon any land of the same quality," where there are 100 stands of bees. We ask, how do you *know* this? and what do you mean by perfection? The fruit may be "perfection" in your estimation, but how do you know that it would not be better if bees were present at blossom time? We insist, again, that it does not prove much to assert that a friend of yours grows the "perfection of fruit" on an island remote from bees. If he had grown fruit for ten years *without* bees and then ten years *with* the bees, there would then be an opportunity for a *fairer* comparison. Again, in your last paragraph you say nothing about the possibilities of the Italians fertilizing the red clover. The probabilities are, that the ordinary hive-bees do ten times more pollen-scattering on these big clovers, because of their numbers, than the bumble-bees. Here, again, if all bees were removed, both bumble-bees and hive-bees, for a few seasons, from access to red clover, and then again for a few seasons allowed to visit the blossoms, the test would be fairer; and then, how do you know that the bumble-bees do not do their share? As we see it, friend Smith, you have unconsciously fallen into the same error in drawing conclusions that you find in the writings of those who affirm that bees do assist in scattering pollen.—Ed.]

THE ELEMENTS OF UNCERTAINTY IN THE RECENT DISCUSSION.

By John C. Gilliland.

There are some well-known facts to be taken into consideration in the discussion of animal life aiding in the fertilization of blossoms and plants. We know, both by revelation and geology, that plants were created before animal life, and had power within themselves to perfect seed, and in their natural forms do so yet. While all forms of plants and animal life are more or less dependent on each other, the lower forms are more independent than the higher. Commencing with the lowest, each new creation was for and looking to a higher order, and all orders of animal life are dependent on plants for continued existence. All orders, whether of plants or animal life, were good, and for a good purpose at first; and the evil and conflict we see is only perverted good. There is nothing evil of itself, as all evil is only perverted good. By the power of his intelligence and selection, man has changed the form and use of many kinds of both plants and animals; and who shall say that the lower forms of animal life have not done the same? So the real question is, How much increase is there in

seed production of plants by insect aid? Are not plants entirely dependent on insect aid for seed production? All progress made is only filling the duty to "go forth and multiply and replenish the earth, and subdue it." By observation and experiment we find what orders of plants and animals are useful, or can be so changed as to be useful, and what order will aid us in making the change, and then aid the development of the useful. Also, find the orders injurious, and destroy them. If we could get all the people in the world to see and think, the progress in subduing the earth would be as great in five or ten years as in all the ages past by the few great minds who have thought and seen things as they are and might be.

There are several elements of uncertainty in the facts stated on both sides in Jan. 15th GLEANINGS. Where fruit and seed do not develop when cold and rain prevent insect visits when blossoms are open, the same causes prevent the normal development of pollen, and, by washing off what is developed, prevent it from fertilizing the blossoms. When a single blossom is covered to keep off insects, it also, to a certain extent, prevents the wind from carrying the pollen of other blossoms to it to aid in its fertilization. A single blossom covered may not fertilize itself; but if a whole tree were covered, enough blossoms might be fertilized to yield a crop of fruit. I saw this chance for error last year in my experiments, and for this reason intend to cover all the plants on three or four feet square by driving stakes and covering with netting, then gather the ripe seed each ten days, also ripe seed on a like space by the side of the covered, and find the seed in each lot at each gathering. This will take out nearly all the elements of uncertainty, and tell whether the time of blooming or temperature has an effect on seed production.

I suggest the bee-keepers make experiments on this question this year on different fruit-trees and other plants, not covering a single blossom by itself, but have a large number under the cover, carefully taking notes of weather, rain, cold, and whether bees worked freely on uncovered blossoms; then how much fruit or seeds produced from same number of blossoms under each condition, leaving nothing to guess at or state from memory. I should especially like to have E. R. Root, G. M. Doolittle, C. C. Miller, and Prof. Cook make the experiment; then if A. I. Root will hold off publication of that leaflet until fall we may have some very interesting reading for the public. Cheese-cloth is very cheap, and it will not cost much to cover a whole tree.

Bloomfield, Ind., Jan. 20.

[Covering certain blossoms and not others may bring in some elements of uncertainty, as you say; but the fact that all the experiments made by Prof. Cook and others point pretty

strongly toward the agency of the bees, is pretty good proof. However, we are sure all candid bee-keepers want to go to the bottom of things; and we hope that, ere another year, the experiment will be tried by several in the way you indicate. We will publish the pamphlet now, and by fall may get out another. The information already secured is too good to hold. If the covering of individual blossoms to some seems objectionable, perhaps the following will answer.—ED.:]

THE TWO SIDES OF A TREE.

Our apple-orchard is situated in such a way that it is exposed to both the north and south winds. About four years ago, as the trees on the south row (Transcendental, that throws out a heavy growth of foliage at the same time it blooms) began to open its bloom, a heavy south wind prevailed for about five days. I noticed, during this period, that the bees could not touch the bloom on the south side of these trees, but worked merrily on the more sheltered limbs of the north side. What was the result? Those limbs on the north side were well loaded with fruit, while on the south side there was almost none to be seen. Does this prove that these trees depend on the aid of insects to fertilize the bloom? I leave it to the judgment of the reader.

F. M. MERRITT.

Andrew, Ia., Jan. 19.

TESTIMONY FROM A FRUIT-GROWER.

Mr. Root:—Find inclosed an article on "Bees for Fruit-growers," written by the editor, Chas. A. Green, and clipped from *Green's Fruit-grower*, published at Rochester, N. Y. Mr. Green is quite a distinguished and well-known fruit-grower of Western New York, and is eminently qualified to judge on the fertilization of fruit-blossoms by the bees.

F. H. FARGO.

Batavia, N. Y., Jan. 25.

Is the honey-bee beneficial or detrimental to fruit-growers? This has been an open question for many years. It has been contended by some, erroneously, that bees puncture grapes, peaches, and other fruit when ripe, greatly to the injury of the fruit. At the same time, it has been noticed that bees frequent the berry-fields and the orchards in great numbers during the blossoming season. It was granted that, in a few cases, bees might be beneficial in fertilizing the blossoms, more particularly of the strawberry, which was known to be often pistillate.

It has now become demonstrated that many kinds of fruits, if not all kinds, are greatly benefited by the bees, and that a large portion of our fruit, such as the apple, pear, and particularly the plum, would be barren were it not for the helpful work of the honey-bee. This discovery is largely owing to Prof. Waite, of the Agricultural Department at Washington. Prof. Waite covered the blossoms of pears, apples, and plums, with netting, excluding the bees, and found that such protected blossoms of many varieties of apple and pear yielded no fruit. In some varieties there was no exception to the rule, and he was convinced that large orchards of Bart-

lett pears, planted distant from other varieties, would be utterly barren were it not for the work of the bees, and even then they could not be profitably grown unless every third or fourth row in the orchard was planted to Clapp's Favorite, or some other variety that was capable of fertilizing the blossoms of the Bartlett.

In other words, he found that the Bartlett pear could no more fertilize its own blossoms than the Crescent strawberry. We have already learned that certain kinds of plums will not fertilize their own blossoms, such as the Wild Goose, etc.

The fruit-growers of the country are greatly indebted to Prof. Waite for the discovery he has made. The lesson is, that fruit-growers must become interested in bees, and *I do not doubt that within a few years it will be a rare thing to find a fruit-grower who does not keep honey-bees*, the prime object being to employ the bees in carrying pollen from one blossom to another from the fields of small fruits as well as for the large fruits.

Think of the changes that have occurred in the last twenty years. In olden times there were as many bees as there are now, and there were not a thousandth part as many orchards or berry-fields as now. Therefore, if the honey-bee has to visit the blossoms as in olden times it will have to visit one thousand, where in olden times they had to visit only one blossom. I verily believe that the barrenness of many orchards may be owing to the scarcity of bees.

During some seasons, the scarcity of bees may be less noticed than other seasons. If the season is a dry one during the blossoming time, many blossoms are fertilized by the winds and other insects than the honey-bee; but if the season is wet, and prolonged rains occur, the honey-bee has no power to fulfill its helpful mission.

This is a question that should receive the attention of every fruit-grower. The honey-bee is useful and profitable by itself alone. C. A. GREEN.

BEEES AND FLOWERS.

By G. M. Doolittle.

It was with more than usual interest that I read the different views relative to the aid bees render in the matter of fertilizing flowers of various kinds, in the last number of GLEANINGS; but what interested me still more was the fact that friends Root proposed to put the pros and cons of the whole matter in pamphlet form for general distribution. This is something we have needed for a long time, and, if I am not greatly mistaken, the doing of this will have a greater influence toward dispelling the mist which has gathered before the eyes of the farmer and horticulturist—gathered more largely through jealousy than otherwise, than any thing heretofore done. I said *jealousy* had been largely the cause of this mist gathering before the eyes of the horticulturist and farmer. I think I hear some one ask why these should be jealous. Only from that innate weakness, common to all, that causes a restlessness to come over us at seeing others more prosperous than we are. No sooner did it go out that Doolittle was making money out of bees than a few

about me began looking around; and when they saw bees at work on the bloom in their orchards, meadows, and buckwheat-fields, they began to reason that Doolittle was getting rich from that which belonged to them, and from this sprang the thought that the saccharine matter found in the flowers was placed there for the development of the fruit; and as the bees took away this sweet as fast as it was secreted by the flowers, an injury must result to the product coming from these flowers and their fields, which injury did much to enhance Doolittle's gains.

Since going into the queen business I have heard less of this than formerly; but from my own experience I doubt not that every prosperous bee-keeper has either heard something similar to this, or if he has not heard it, his neighbors have talked it when not heard by him. I have even been asked for ten pounds of nice comb honey as pay for what honey the bees gathered from a ten-acre lot of Canada thistles which the owner of the land had allowed to grow up through his shiftlessness.

Such a pamphlet as the one proposed will do away with all this way of thinking, if placed in the hands of those about us before they begin to be jealous; and instead of their thinking that we are getting rich off their broad acres they will welcome the bee-keepers of the land as a blessing in helping them to secure good crops of fruit and grain.

It will be remembered that I have taken a little different view of the matter than most of the writers on this subject; and as I believe this view is the right one, I wish to say a few words further by way of emphasis in the matter. The view I hold to, and, as I believe, the only *right* view, is, that the first object of honey in the flowers was *not* as a food or luxury for man, nor even to sustain the life of the bees, but as a means to an end, and that end was, that the fruit, or female blossoms of plants which could not be possibly fertilized in any other way, might be fertilized through the agency of insects which would be attracted to these flowers by the tempting and attractive morsels of sweet they spread out before them as a sumptuous feast, while honey as food for the bee and for the use of man came in as a secondary item. As Gregory puts it in his treatise on squashes, "The *primary* reason why a squash grows, is, to protect and afford nutriment to the seed—the use of it as food being a secondary matter," and the same reason holds good when we look into this honey matter. Why is honey placed in the flowers? To attract insects that the blossoms may be properly fertilized, *primarily*; and, secondly, for food for these insects, which food for insects, in case of the bee, is utilized by man.

Why I come to quote Gregory, as above, was because I knew he said something that was favorable toward the bee side of this fertilizing

matter; and in looking it up I ran across the sentence quoted above. As Gregory is not a bee-keeper, what he says can be taken as an unbiased decision. Here is what he says for the bee along this line: "The female blossoms of the squash are so covered and hidden by the tall leaves, that it is evident that the fertilizing pollen must be conveyed to them by the bees, to whom the squash-field appears to be a rich harvest-field. All of the crossing or mixing of squashes is caused by the pollen from the male flowers of one variety being carried by the bees to the female flowers of another variety." He further states, that, if the bees are kept from these female blossoms by means of netting or otherwise, the embryo squash, at their base, will always turn yellow and die, unless pollen is carried by man from the male to the female blossoms, as is done in the hybridizing of squashes to produce different varieties. Here is something for Mr. Fultz and the doubting ones to disprove before they can establish the merits of their side of the matter, for I aver that, if honey is placed in any one flower to attract insects so that seed can be perfected, and if no seed can be perfected without these insects, in that variety of flower, then honey was placed in all flowers which secrete nectar, for the sole purpose of attracting insects as aids in their fertilization, and that fruitage to its highest perfection can not be obtained except by the aid of these insects which are attracted by this nectar. I also aver, that, if the above is true, and I can see no logical reason why it is not, then all plants and trees whose blossoms do not secrete honey are capable of self-fertilization through the agency of the breeze or otherwise; hence the taking of all classes of plants and nut-bearing trees to sustain an opposite theory is fallacious, and not worthy of the best efforts of any person. As a matter of history that should go into the pamphlet to make it complete, I would cite the case of bees being banished years ago, by statute, from the town of Wenham, Mass., on account of their supposed injury to the apple crop of that town. While so banished, the interior orchards of the town gave scarcely any fruit, the little given being very imperfect; while all around the borders, where bees were kept, the fruit set and perfected in the usual style. After a few years of such conclusive proof as this, that the bees were the orchardists' best friend, the law was stricken from the statute, and the bees invited back, to the perfect satisfaction of all concerned.

Again, I wish to note, as a matter of history, that, during the past season of 1893, very little buckwheat honey was secured from the buckwheat regions of the State of New York—so little that we have had, for the first time in my remembrance, buckwheat honey selling in our markets for nearly if not quite the same price as No. 1 clover honey, while it usually sells for about two-thirds the price of clover honey.

And what has been the result? Why, the unheard-of thing of buckwheat grain bringing 75 cts. a bushel, on account of its scarcity, while the best of white wheat is selling at only 62 cts. per bushel. As a general thing, buckwheat brings from one-half to two-thirds the price of wheat. That it now brings nearly one-fourth more than the best of wheat tells very largely, under the circumstances, on the side of the bee.

Borodino, N. Y., Jan. 22.

[The following is an extract from a recent government bulletin entitled *Insect Life*, page 254.—ED.]

BEES OF GREAT VALUE TO FRUIT AND SEED GROWERS.

By Frank Benton.

At last fruit-growers and bee-keepers are getting into right relations with each other. The numerous discussions which have taken place regarding the value of bees as fertilizers of fruit-blossoms, and of those blossoms of plants grown for their seeds, and regarding the alleged damage to fruit by bees, have led to close observation and careful experimentation, the results of which show that the interests of these two classes of producers conflict in but trifling respects—that, in fact, bee-keepers and fruit-growers are of great help to each other, and indispensable if each is to obtain the best results in his work.

Bee-keepers have never complained but that the growing of fruit in the vicinity of their apiaries was a great benefit to their interests, hence their position has been merely a defensive one, the battle waxing warm only when poisonous substances were set out to kill off the bees, or when fruit-growers sprayed their orchards with poisonous insecticides during the time the trees were in blossom; or, again, when efforts were made to secure by legislation the removal of bees from a certain locality as nuisances. Fruit-growers first relented when close observation and experiment showed that wasps bite open tender fruits; that birds peck them; that they crack under the action of sun and rains, and hail sometimes cuts them, the bees coming in only to save the wasting juices of the injured fruit. The wide publicity given to the results of the experiments made under the direction of the United States entomologist, and published in the report of the Commissioner of Agriculture for 1885, have no doubt contributed much to secure this change among fruit-growers.

But now it would appear that the bees have not only been vindicated, but that, in the future, fruit-growers are likely to be generally regarded as more indebted to bee-keepers than the latter are to the fruit-growers, for the amount of honey the bees secure from fruit-blossoms comes far short of equaling in value that part of the fruit crop which many accurate observations and experiments indicate is due to the complete cross-fertilization of the blossoms by bees. The observations and researches of Hildebrand, Müller, Delpino, Darwin, and others, as well as the excellent explanation of the subject in Cheshire's recent work,* have gone far to prove how greatly blossoms depend upon the agency of bees for their fertilization and hence for the production of seeds and fruits.

* "Bees and Bee-keeping. Scientific and Practical," by Frank R. Cheshire, F. L. S., F. R. M. S., Vol. I., pp. 279-328.

The facts they have brought forward are gradually becoming more widely known among fruit-growers and bee-keepers, and additional evidence accumulates. A case illustrating very clearly the value of bees in an orchard has recently come to the notice of the writer, and its authenticity is confirmed by correspondence with the parties named, who are gentlemen of long and extensive experience in fruit-growing, recognized in their locality as being authorities, particularly in regard to cherry culture. The facts are these: For several years the cherry crop of Vaca Valley, in Solano Co., Cal., has not been good, although it was formerly quite sure. The partial or complete failures have been attributed to north winds, chilling rains, and similar climatic conditions; but in the minds of Messrs. Bassford, of Cherry Glen, these causes did not sufficiently account for all the cases of failure.

These gentlemen recollected that formerly, when the cherry crops were good, wild bees were very plentiful in the valley, and hence thought perhaps the lack of fruit since most of the bees had disappeared might be due to imperfect distribution of the pollen of the blossoms. To test the matter they placed, therefore, several hives of bees in their orchard in 1890. The result was striking, for the Bassford orchard bore a good crop of cherries, while other growers in the valley who had no bees found their crops entire or partial failures. This year (1891) Messrs. Bassford had some sixty-five hives of bees in their orchard, and Mr. H. A. Bassford writes to the *Entomologist*: "Our crop was good this season, and we attribute it to the bees." And he adds further:

Since we have been keeping bees our cherry crop has been much larger than formerly, while those orchards nearest us, five miles from here, where no bees are kept, have produced but light crops.

The *Vacaville Enterprise* said last spring, when referring to the result of the experiment for 1890:

Other orchardists are watching this enterprise with great interest, and may conclude that, to succeed in cherry culture, a bee-hive and a cherry-orchard must be planted side by side.

And now that the result for 1891 is known, "others," so Mr. Bassford writes, "who have cherry-orchards in the valley are procuring bees to effect the fertilization of the blossoms."

HOW BLOSSOMS ARE FERTILIZED; WHY SOME FLOWERS ARE MORE GAUDY THAN OTHERS; EXPERIMENTS OF CHARLES DARWIN.

By J. E. Crane.

Many volumes have been published in several different languages upon the fertilization of flowers—the first by Christian Conrad Springle, in 1793; but the subject attracted but little attention until thirty or forty years later, since which many botanists have given the subject much attention. Our most eminent botanists now classify flowering plants in their relation to fertilization into two classes: *Anemophilous* and *Entomophilous*—literally, wind-lovers and insect-lovers. The flowers fertilized by the wind are dull in color, and nearly destitute of odor or honey. The sexes are frequently separated, either on the same or on separate plants. They produce a superabundance of pollen, light and dry, easily transported by the air or wind.

Pines, firs, and other conifera, are familiar examples, which sometimes fill a forest with "showers of sulphur" when shedding their pollen. Our nut-bearing trees are examples among deciduous trees. The grasses and grains are familiar to all. A kernel of corn will grow as well alone as with other plants; but "the ear will not fill" unless it can receive the wind-wafted pollen from neighboring plants. On the other hand, those plants which seem to have need of bees or other insects to carry their pollen from one flower to another have more showy blossoms, with bright colors, or white, which are showy at dusk, or they give out a strong perfume or nectar, or both. The pollen grains are moist or glutinous, or hairy, or otherwise so constructed as to adhere to the insects that visit them, and thus be carried from flower to flower. In this class of plants or flowers many ingenious arrangements are provided to secure cross-fertilization. One sex is found in one blossom, and the other in another, on the same plant, as in the squash and melon families. In other species the sexes are found upon separate plants, as the willow-trees. In some plants the pistils appear first, and become fertile before the stamens ripen their pollen. In others the stamens shed their vitalizing dust before the stigma of the pistil is ready to receive it.

The common red raspberry matures its pistils first, so that, unless the bees or other insects carry the pollen to it from other earlier blossoms, the fruit is imperfect.

The partridge-berry is very interesting. The blossoms upon about half of the plants produce their stamens first; the other half, the pistil. In a week or ten days the order is reversed in the same flowers.

Many flowers that invite insects appear to be capable of self-fertilization, and often are; but the pollen from some neighboring plant of the same species seems more potent. Some flowers are so constructed that the stamens are placed so that their pollen can not fall upon the stigma of the same flower, but with special adaptation for the transport of pollen by insects from one flower to another. One curious plant produces small inconspicuous flowers early in the season, capable of self-fertilization; later in the season it produces more showy flowers that can become fertile only through the agency of insects.

Many plants remain constantly barren unless they receive the visits of insects. Many of your readers have doubtless observed how the fuchsia or begonia never produces seed in a closed room; yet, when set out of doors in summer, they seed abundantly. Still other plants never produce seed because the insects that feed upon their blossoms have not been imported with the plants.

But this is a large subject, and to me one of great interest, as I study the many ways the

Author of nature has provided for the best good of all his works. A large number of examples have been given of the value of bees as agents in the production of fruit and seed, but I will give one or two more.

Mr. H. A. March, of Puget Sound, while here last summer, informed me that he produced large quantities of California seed, and found bees very valuable, as the seed was much more abundant when bees were provided to work on the flowers.

The stone fruits seem almost incapable of self-fertilization, as is often proved by trying to grow peaches under glass, success seeming to come only when bees are provided when the trees are in bloom.

A curious problem has presented itself to the horticulturists of this country for a number of years past, in the refusal of some varieties of the chicka plum to produce fruit in the Northern States unless set near some other variety or species of plum, that insects might carry the pollen from one to the other. Such a tree I can see from my window as I write, that is a bank of bloom every spring, but has never, to my knowledge, produced a crop of fruit.

Now, suppose it were true that all trees or plants that produce fruit or seed of value for the use of man would become fertile without the aid of bees or other insects, would it prove them of no value? Not at all. Enough has been written to show that the Creator has desired cross-fertilization among plants, and has wisely provided for it in a multitude of ways; and the chances of such fertilization appear to be as great among plants as among our bees, for which such special arrangement has been made. We might assume it to be valuable or necessary, even if we could see no good reason for it. We all know that birds or domestic animals will prove fruitful for one or perhaps several generations in spite of the intermarriage of near relations; but it is, I believe, the universal experience that such unions are most unwise, and, as a rule, prove injurious.

Some twenty-five or thirty years ago Charles Darwin, in studying this subject, and noting the provisions of nature for the cross-fertilization of flowers, became so much interested in it that he began a large number of experiments to test the value of insects in cross-fertilization, and the effects of cross and self fertilization upon plants. His experiments were conducted with great care and continued through several years; and his book on the effects of "Cross and Self Fertilization," describing these experiments, containing several hundred pages, is very interesting reading to say the least.

Of some 125 plants experimented with, more than half were, when insects were excluded, either quite sterile or produced less than half as much seed as when insects were allowed to visit them. Among his catalogue of these plants I notice the white and red clover. His

experiments with these are very similar to those of Prof. Cook, late of Michigan Agricultural College. He says, page 361, of red clover, "One hundred flower-heads on a plant protected by a net did not produce a single seed, while 100 heads on plants growing outside, which were visited by bees, yielded 68 grains of weight of seeds; and as 80 seeds weighed two grains, the hundred heads must have yielded 2720 seeds. His experience with white clover was nearly the same.

Another most interesting result of his experiments was that plants grown from seed from self-fertilized flowers were, as a rule, when grown side by side with seed from cross-fertilized flowers, much less vigorous, although in other respects the conditions were as nearly alike as it was possible to make them. On page 371 he says, "The simple fact of the necessity in many cases of extraneous aid for the transport of the pollen, and the many contrivances for this purpose, render it highly probable that some great benefit is thus gained; and this conclusion has now been firmly established by the superior growth, vigor, and fertility of plants of crossed parentage over those of self-fertilized parentage."

Middlebury, Vt., Feb. 8.

STRONG EVIDENCE FROM CANADA, ON BEES AS FERTILIZERS.

By Allen Pringle.

It would seem that there are two sides (and sometimes more) to every question outside of mathematics. Until I read the pros and cons on the above subject in the last issue of GLEANINGS I had supposed that this matter was settled, and fairly within the category of what is called "exact science." While my own opinion on the subject remains unchanged, I realize the fact that others have contrary opinions; and, hence, line upon line, fact upon fact, and argument upon argument, may be necessary to establish what is already established. The subject is one of practical importance to bee-keepers, and this is sufficient justification for the space given and the invitation to discuss. As is often the case in such controversies, both sides are right and both wrong—that is, partially so. It is more than probable that the bee-keepers have been claiming too much for the bees in the fertilization of fruit-bloom; and now "the party of the other part" is going too far the other way, and denying them any credit or function in the matter at all. When the bees were attacked by the fruit-men as the enemies of ripe fruit, and all sorts of charges made against them, the bee-keepers felt called upon to defend their pets, and in so doing discovered that there could be no fruit raised without bees, and told the fruit-men so, and the whole world also. This was a mistake. Fruit may be raised without the aid of the honey-bee. There are other

means of fertilization and cross-fertilization—other winged insects—the wings of the wind, etc. But for certain fruits and clovers, the bee is, *par excellence*, the ministering angel in their fruition. Let no one deny this. The man of experience, as well as the man of science, will contradict him if he does.

I have kept bees for 30 years, and have grown fruit and clover alongside for 30 years. I have also studied a little and experimented a little in this line as well as many other lines. As to some kinds of fruit—notably apples—I have observed that if, during the bloom, the weather was such that neither the winged insects nor the wind (being wet and cold) could perform their function with the flowers, the fruit was *non est*. When the weather at other times was favorable, and the bloom abundant, I have excluded the bees from certain portions of the tree, only to find the fruit also excluded—but only from those certain portions.

In the spring of 1892 I was summoned to appear before a legislative committee of the House of Assembly of Ontario, at Toronto, to give evidence as to the effects on the apiarian industry of spraying fruit-trees, while in bloom, with Paris green and other poisons. Our Ontario Bee-keepers' Association had moved for an act to prohibit the spraying while the trees were in bloom, as the bees were being poisoned in various places, and the spraying at such a time was unnecessary, and, indeed, injurious to the fruit as well as poisonous to the bees. The Minister of Agriculture, for the enlightenment and guidance of the legislative committee in a matter so important where the interests of the apiarists and horticulturists were alike involved, had summoned the leading men in both industries in the province to appear before the committee, to present the facts, the experiences, the pros and cons of both sides. The scientists were also summoned from Ottawa and Guelph—Dominion and Provincial entomologists—to speak for science. The questions of spraying, fertilization, etc., were discussed. The horticulturists, with one single exception, admitted the valuable and indispensable offices performed by the honey-bee in the fertilization of the fruit-bloom: and this was corroborated and confirmed by the entomologists. The fruit-growers agreed that "the bees play a very important part in cross-fertilization, and, therefore, should not be destroyed;" that "we are very generally dependent upon insects for the fertilization of our orchards. To destroy them to any extent would be very injurious to fruit growers."

Prof. James Fletcher, Dominion Entomologist, said, "Bees do not visit fruit-bloom in dull weather, and then we get little fruit in consequence." It may be well to quote Prof. Fletcher here on a cognate point also, as being a high authority. He said: "As to bees injuring fruit, there is no direct evidence. Wasps may start the work, and then bees continue it. We have

never been able to find a case of primary injury by bees." (See official report of meeting.)

The consensus of the meeting was, that "bee-keepers and fruit-growers are of great help to each other, and even indispensable, if each class is to obtain the best results in their work."

The act we sought of the legislature became law in this Province, as follows: "No person, in spraying or sprinkling fruit-trees, during the period within which such trees are in full bloom, shall use or cause to be used any mixture containing Paris green or any other poisonous substance *injurious to bees*." The penalty clause follows, which I need not quote.

The two following facts are well established; viz., that bees perform an important and well-nigh indispensable function in the fertilization of fruit-bloom; and that, in order to properly protect the fruit from the ravages of destructive insects, it is not necessary to apply the poisonous remedies at a time when the bees will be injured thereby—that is, during full bloom, when the bees visit the trees for nectar. Darwin, Hilderbrand, Müller, and other naturalists, have, by their observations and experiments, placed these matters (of such prime importance to the bee-keeper) beyond question.

Selby, Ontario.

[Although we have taken up eight pages in this issue, to say nothing of five or six taken up in a former issue, on the same subject, we are obliged to omit two or three good articles on the affirmative. We have put in all those on the negative side thus far received, and have endeavored to give it a perfectly fair hearing; but we think that, when our readers see the whole, they will acknowledge that the arguments on the bees' side, in number and variety, considerably overbalance those on the other side.]

We have room only to say that Dr. Miller has followed up very closely the writer in the *Rural New-Yorker*, who held that bees have nothing whatever to do with the fertilizing of fruit-blossoms. Indeed, he has cornered him with an array of evidence that would be enough to convince almost any man except one who will not be convinced against his will. In a foot-note the editor of the *Rural* says he is not ready to give his say yet; but elsewhere, editorially, he puts in this pithy paragraph in favor of the bees:

A word for the bees. In those great greenhouses near Boston, where early cucumbers are grown, it is always necessary to have one or two hives of bees inside to fertilize the flowers. No bees, no cucumbers, unless men go around with a brush and dust the pollen from one flower to another.

Whatever the negative has to say, this will be a hard nut for them to crack. If the bees are generally acknowledged to be an aid in greenhouse work, why not out doors? A few positive cases of this kind, are worth "bushels" of negative testimony from the other side. —Ed.]

UNJUST TAXATION OF BEES.

UNHOLY PRACTICES IN THE HOLY LAND; AN INTERESTING ARTICLE; CONCLUDED FROM OUR LAST ISSUE.

By Ph. J. Baldensperger.

In my previous article I spoke of the outrageous tax laid upon our hives, amounting to some \$600 on 180 hives, or \$3.33 $\frac{1}{3}$ per hive. Our only resort now was to refuse to pay, and await events. As stated, we had apiaries in Judea and Philistia. Two of my brothers, Emile and Jean, were living near Bethlehem with their apiaries; my oldest brother, Henry, had taken his apiary toward Hebron, myself in Philistia. The apiary near Bethlehem was sequestered. Four negro guards were sent out to keep the bees, and prevent them from being moved. My brothers were allowed to work, take the honey, etc. Our bees—that is to say, a lot of them, were sold at auction in the town of Jerusalem; but as the people in general know very little about bees, they brought a very low price. It was ridiculous—I think something less than a dollar a hive. The silver money of the size of a dollar in Turkey is called a *majidi*—from the Sultan, Abd-el-Majeed, who first made them. As it is a rule in Turkey that the proprietor have the last word when a thing is sold at public auction, he has the choice of buying it himself; but when I came to the court I declared we were not inclined to buy our own bees at such a low price, so it was announced that they would come out to take the bees on a certain day. A young man who had gained some ideas of apiculture of us was hired to haul the bees on camelback, and take them to his home, where he would work them. My brothers put the bees all into supers—no bottom-boards—and the quilts were placed in a loose way. The entrances were not regulated, and we retreated to await the moment of departure. Triumphant—a gang of officials, guards, cameliers with 12 camels, and said youthful bee-keeper, came there and awaited the evening, with satirical remarks. The villagers, who had received bribes, were rolling for joy to see us deprived of bees.

When the sun was down they moved to the apiary, enjoying the deed they were about to perform. When the first hive was lifted, the bees rushed out, stinging. A second hive was tried with the same result, and with great consternation. They withdrew, and in Jerusalem accused us of having put out hives without bottoms, and that it was not lawful. Of course, there exists no law saying how bees are to be kept, and we said we chose to keep them as they were.

They then made up their mind to take hold of my brother Henry's apiary, near Hebron, and said they would do so. Accordingly, Henry and myself immediately began hauling; but a Mohammedan feast of atonement coming in, three

days' leisure was left us, so we took Christian cameliers, and, while the roads on which they expected us to pass were guarded near Jerusalem, we passed a rough mountain way across the mountains of Judea. It seemed to us something like Hannibal crossing the Alps with his elephants, and a terrible time we had of it. It took us three nights to reach the plains of Philistia, out of reach of the Jerusalem Pashalik. Camels stumbled over rocks, and threw down their loads; ropes got loose, and hives fell off; the road was strewn with debris, like the way of an army in retreat; so my brother Henry remained behind to gather up, and had taken the food with him. A village of Mohammedans would not sell us even any bread. They said they had no bakers. A boy went around begging a few loaves, and I had to live on the beggar's share. We had carried our bees out of immediate danger of being seized. I waited again for new orders. We knew it would take considerable time for orders to be transmitted from Jerusalem to Gaza, for the district in which we settled was dependent on Gaza. The Jerusalem officials, as soon as the feast-days were over, set out to seize the bees in the Hebron district; but

When they came there the field was bare,

And so the poor Turks had none.

They found the Arab guardian, an old culprit and highway robber, who had turned from his wicked ways and tried to be honest, if God would be merciful to him and give him a good living, as he put it; a few empty hives remained as odd numbers. The camels take just eight hives each. On questioning him about the bees' whereabouts, he said he thought they must have swarmed, as he heard the bee-keeper say they do swarm sometimes. They explained the way of swarming as nearly as they could, but he insisted on the possibility of swarming hives and all.

Low-spirited they again returned to Jerusalem, and finally asked us if we would not prefer to treat with them, for in some way or other they expected us to prepare new tricks. They were not wrong, either, and we agreed to pay half the sum, payable in the course of the following year. This was one of the causes that led two of my brothers to turn their backs on such lawless countries, carrying a considerable number of hives with them. In the following year nobody would have any thing to do with bees, as the costs of this nearly two-years' process was about as much as the sum we paid, and we have, since then, been invited to settle affairs as best we thought, without any further annoyance. This has been done; and the villagers too, who had always benefited by our presence in their village, lost our patronage, and, what was worse, lost almost all their bees. It is well here to say that some of the false witnesses owned bees, and generally they believe that bees die off if a false witness is given con-

cerning them, or a strife arises between bee-keepers. They had sworn falsely by king David, and those saints will punish such delinquents. They had assembled on Mt. Zion, near Jerusalem, and put their hands to the window of King David's mausoleum, and had sworn by the life of God and the prophet David that all they said concerning our sixfold hives was true, and some others had to swear that the men that swore were truthful.

Two years after, a beautiful apiary of some 300 hives was reduced to 30 hives, with almost no surplus honey, and the taxes to pay. They herein saw the just punishment for swearing at all; for, though false swearing is a deadly sin which the saint may kill on the spot, as they believe, still they believe, too, that swearing is no good, whether right or wrong, though they do swear for mere nothings, but not in such a solemn way as they did there. Years passed by, and the villagers use all their efforts to call us back. They very much regretted the annoyance, but their selfish regrets have led to nothing up to date, and meanwhile we have found better bee-pastures, and have kept out of their way. I mean my brothers have, for it is long since I closed accounts with the despicable fellahin of Palestine and Turkish misrule, and hope they may continue to leave in peace the bee-keepers settling in Palestine.

Though the honey resources of Palestine are excellent, the distance of the market, and, consequently, the cost of transportation to the nearest ports, Marseilles and Algiers or Trieste, together with the duty laid on honey, are so great that it would be preferable, if honey-raising were the only aim, to settle in some well-organized place, with a view of selling honey at a remunerative price, and avoiding the risk of shipment, besides the cost.

Nice, France.

[It seems that the publicans and sinners have not all passed away yet in Palestine. Strange how history repeats itself. These things would not be if Christianity still had a hold upon that land instead of Mohammedanism.—ED.]

HONEY IN THE SAN BERNARDINO MOUNTAINS.

HOW THEY CROWD OUT THE BEE KEEPER.

By C. W. Dayton.

The following observations and conclusions were made in or close by the San Bernardino range of mountains, which begins at the coast on the west, and extend eastward for a distance of about 150 miles, entirely across the inhabited part of the southern portion of the State.

As all old bee-keepers know, and all new ones soon learn, there is little or no good honey obtained but by keeping the bees in the moun-

tains; so we may journey for many miles across beeless tracts of farming or fruit country, until, reaching the mountains, we find located, one or two miles apart, along their base or in the numerous canyons, apiaries as regularly located as the stations indicated on the map of a main line of railroad. To place another apiary anywhere in the line is like adding another link to an already perfect chain. These apiaries contain from 50 to 500 colonies, as the location in the range of mountains is more or less favored in honey flora, and locations *do* thus exceed each other almost to the extent of ten to one.

The apiaries are placed at the point where the valley ends and the mountains assert themselves. First, because these mountains exceed nearly all others in abruptness, and can not be climbed except by prepared trails; and, again, the land close by them is formed of granite rock and gravel mixed, that has been washed down from the mountain sides for ages—land which becomes too sterile for peaches, prunes, grapes, or apricots under a few years' tillage.

When chaparel (greasewood) and sage are first cleared off, the land and the rubbish plowed under, it supports trees for a time, but is too high and dry for clover or alfalfa to grow; artificial fertilizers quickly disappear in the gravelly subearth; and, fruit failing to pay for expensive cultivation, the orchards are allowed to "play out," and the possessor of high-priced, nearly worthless land, goes into bee-keeping as a last sustaining straw, with the idea that bees "work for nothing and board themselves." Well "heeled in" they seldom take a journal, or produce comb honey, and construct their hives with the main intention of keeping "millers" out.

Farther from the mountains there is an underlying bed of hardpan which has, for years, caught and accumulated the richness from the higher lands, and nearly any crop may be grown, and all fruits are of better quality. While these mountain orchards are making astonishing growths, and producing fine specimens of fruit for a time, more "tender feet" are enticed from the frozen North and East to clear up new fields of greasewood and sage, and capitalists obtain their fancy prices.

Los Angeles is about midway along these mountains, and near there more chaparel grows than elsewhere, and the amount decreases either east or west toward San Jacinto or Ventura. The soil changes gradually from dark granite to limestone and whitish clay, and the different sages take the place of chaparel. In winter the sages are dead and light brown in color, and, with the light-colored rock and soil, the whole mountains receive the distinctive shade when viewed from a distance of twenty miles. The granite and chaparel covered mountains are known by their evergreen cast. The yields of honey the past season in the differently located apiaries has varied from 120 to

300 pounds to the hive, in almost exact conformity to the consistency of the mountains, and the apparently consequent greater or less amount of sage. As the sages increased in either direction gradually, and the soil changed, so the honey-yield gradually increased. The variation of the honey-flow is usually ascribed to the atmosphere; but in this case there appear to be indications that the soil made the difference. Near Mount Wilson, in the midst of the chaparel district it is told of apiaries yielding 300 to 400 lbs. to the hive. Even if this is true, it was years ago, when there were fewer apiaries, and the present extensive fruit-orchards were covered with sage. What sage remains along the mountains is a comparatively narrow strip, and is of a less thrifty and varying growth than were the valley sages. While the fruit-man is led into the business by the land-speculator pointing to the growth of greasewood, which will thrive upon the desert itself, the would-be bee-man often thinks, the more mountain the more honey.

Downey, Cal., Jan. 20.

[Just as extensive agriculture, such as the substitution of wheat-fields for pasture-lands with its acres of white clover, has made what was once profitable bee-keeping now unprofitable, so the starting of fruit-ranches in California is taking away the sources of honey, and the bee-keeper is obliged to hie away to the mountains. It must be a little comforting to the bee-keeper to know that there are places where the bees may remain undisturbed.—Ed.]

MANUM IN THE APIARY.

A PROPOSED NON-SWARMING SCHEME.

By A. E. Manum.

"You will observe, Mr. Daggett, that this colony is very strong; in fact, I choose strong thrifty colonies for these experiments, in order to test these different methods thoroughly. I am running this colony on what I call the 'sandwich' plan. After the queen had filled the combs in the main brood-chamber I placed a half-depth brood-chamber on top, with a perforated zinc between the two; and after shaking a few bees into this upper chamber I placed the queen (that I had previously removed from below) with them; and as soon as the honey-flow came I raised this upper half-story and placed a tier of sections between the two chambers, being particular to raise the zinc also, and placing that over the sections to prevent the queen from going down into the sections to deposit eggs; therefore you will see that the queen is confined to the upper brood-chamber."

"But, Manum, what about the lower brood-chamber? Don't the bees build queen-cells there after the queen is removed?"

"Well, Mr. Daggett, that is what I am testing. I have looked this colony over but once since putting the queen in the garret, and that was when I put on the sections, and I found two queen-cells; but I thought at the time, that probably those cells were started, and had eggs in them when the queen was removed, because they did not look like *forced* cells; and, again, had the bees been determined to raise a queen below to replace the old one, it seems to me that they would have started more than two cells; and after looking them over this time, if no cells are found I shall think this plan worthy of further trial. We shall see."

"Manum, how many days is it since you removed the queen from below?"

"The record here says 12 days; and on the sixth day after her removal I found the two cells I have mentioned, and now it is 6 days since that time. I will now remove this upper brood-chamber, and now the sections. My! they are quite heavy. I will look at them. Yes, they are doing well in them. This section is partially capped; but as I took it out from the center of the clamp it is not to be wondered at. I will take out one from the corner of the clamp (section-case). Well, there! just look at this, Mr. Daggett. If any thing, this section is nearer completion than the one taken from the center. What does this mean? Let us consider this a moment. Ordinarily the bees complete the center sections first, so that I am obliged to 'jump' them by exchanging center ones for those on the outside; but in this case *all* are being filled together. It must be owing to there being brood above and below. I must give this colony another tier of sections before I leave them, and I believe I will put them on the top of this set, inasmuch as the queen is confined above. There is one thing, however, that I don't quite like; and that is, where they have capped the sections the cappings do not look as white as they should. I fear that this will be one trouble with this plan of 'sandwiching.' The bees, in their attempt to get pollen up to the queen-apartment, will soil the sections more or less. We will now examine the combs in the lower chamber. Well, there, Mr. Daggett; the brood is all sealed, and not a queen-cell started. That is encouraging."

"How long, Manum, are you going to keep the queen above before you return her to her old apartment below?"

"It is time now to return her, as it is 12 days since she was removed; consequently there is nothing below from which the bees can start queen-cells; but as I want to test this experiment more thoroughly I will give them a frame of uncapped brood from some other hive. I have to take it from another hive because the frames in this upper story are too shallow, they being only half the depth of the lower ones. There! now with this comb of brood containing eggs, if they do not start queen-cells

I shall think this plan worthy of further and more extensive trial; and if, when I come here next week, I find no queen-cells I shall put the queen below and give them another tier of sections—providing I think it necessary—and I shall feel quite sure there will be no swarming fever in this colony. Well, there, Mr. Daggett, it is nearly one o'clock, and you remember I promised my wife we would be back home by half-past 12 to help pick strawberries, as she said some of her pickers had disappointed her to-day."

On our way home Mr. Daggett asked:

"Manum, do you know any thing about a young man who lives in our county, by the name of Langdon, who has invented a new arrangement to prevent swarming?"

"Yes, I have seen him; in fact, I visited him last winter, where I had a very enjoyable time. I found him to be a live young bee-keeper who is very enthusiastic, as also is his father. When I went there I found them both busily at work in their little factory, where they have all needed machinery for making their own supplies. This machinery is run by steam-power; and when the young man, Mr. H. P. Langdon, showed me his new device for preventing swarming I was not so much surprised, inasmuch as nearly all the machinery in his shop was of his own make, showing that he is a genius and a natural mechanic."

"Then you saw his new device?"

"Oh, yes! he explained it all out to me, as well as his house-apiary. But here we are at home again, and I will tell you all about it some other time, with my experience with something similar to his device."

Bristol, Vt.

EXTRACTED VERSUS COMB HONEY.

REPLY TO E. FRANCE: WILL A COLONY YIELD MORE COMB THAN EXTRACTED?

By *R. C. Aikin.*

For upward of 15 years I have produced both comb and extracted honey in the same apiary. I used to think my yield of extracted, one third more than of comb. I did get more extracted than of comb; but closer observation finally led me to believe that it was at a sacrifice of winter stores, at least in part.

In Oct. 15th GLEANINGS, page 776, Mr. E. France says: "Well, it just happened that we used up one set of combs more than we counted on in making new colonies, and one hive was left empty of combs. The bees were there. Now, when we came again all the hives were filled with honey—that is, the combs were. The yard averaged 25 lbs. of extracted honey to the colony. That empty hive had to build comb for their honey. They did not have 5 lbs. of combs, all told—honey, bees, and all—making a difference of 5 to 1. It was as good a colony

as the average—I think better. How is that, R. C. Aikin?"

Now, friend F., why did you stop there? Your argument is *very* lame. You fell into the same trap that many others have fallen into. I must ask you some questions. How much more honey had they in their brood-chamber than the other colonies? How long was it after you robbed them of their combs before you went back again? Also, how much time was lost by them before they could get ready to build comb after being so unceremoniously robbed? You must see that these are pertinent questions. With an abundance of combs on hand in which to store, surely that colony would not be secreting wax so as to go to building comb at once.

This involves to some extent the question of wax secretion—whether voluntary or involuntary. I believe it is voluntary, but that they require time both to start or stop it. We know they will not build comb ahead of their needs.

Four years ago we had a sudden and very rapid flow of honey. We were feeding to keep up brooding, and they would have starved but for the feed given. In four days they had all available comb full, and were at work on foundation. Many colonies used enough old wax in *building new comb* to have held 5 lbs. of honey. They did not get under full headway secreting, for about five or six days at least. I admit that, under such circumstances, we may at times lose some honey; but on the other hand we may lose wax when a sudden stop comes in the flow.

During the season of 1890 I managed 165 colonies in three apiaries—one apiary located at home, two seven miles out and two miles apart. As a whole, the home apiary was run for extracted, and the out for comb honey. The total crop was twelve tons. About the same per colony was yielded in each yard, but the extracted-honey colonies had less in the brood-chamber than the others. A few colonies in the home yard were run for comb—the strongest—and in the out-yards a few of the weakest for extracted. The average yield per colony was 150 lbs. The greatest yield from any one colony was 250 lbs., the least 25 lbs., both comb. Colonies of apparently equal strength showed little difference in yield, whether comb or extracted.

In 1891 all were run for comb, save a few of the weakest colonies. The latter did not give as much surplus per colony as those run for comb, yet, according to the theory of "double," yes, "and more than double," these weak colonies should have at least equaled the average yield of those run for comb, but they did not.

The seasons of 1892 and 1893 showed about the same results as to proportion, but the crop was very light.

Now, friend F., if you have produced both comb and extracted at the same time and place, you must have observed this: That the comb-honey colonies, by all odds, store more honey in

their brood-chambers than do the extracted-honey colonies. You get more extracted honey, but leave less in the hives; yet your colonies did not gather so much more. This may not account for *all* the difference; but well nigh all that is unaccounted for lies in the management. It takes about as much more skill to make a real successful comb-honey producer as the *apparent* excess of extracted over comb.

It is easier to produce the extracted, and care for it so as to make a merchantable article, but it costs more for storage room for fixtures and their care, while the product brings about half what comb does per pound. In the matter of putting honey in barrels, let me also give you a bit of experience. I had two white-oak barrels, hand made, that I had used for two or three years. They remained empty, and in a dry place, throughout the summer, until the fall flow, when the hoops were driven as tight as they would bear without bursting (seven and eight hoops to the barrel, and heavy), and were then filled with honey. Soon after filling I shipped them to this State from Iowa. In a few weeks after arriving here the hoops were dropping off and the honey leaking. These were 25-gallon barrels, and one of them I have here to-day, a good barrel after about ten or more years of service. You may be able to *keep* your honey in barrels; but how about it when you ship?

Now, friend F., I want you to take a number of colonies, run one half for comb and the other for extracted, then weigh the total results, both in and out of the brood-chambers, and report the number of pounds gathered by each division. I am perfectly willing to trust to you for the details.

It matters not so much to you and me as to the real right or wrong of this question; but if twice as much extracted can be produced as comb, at the same cost, and the extracted will bring eight cents while the comb brings sixteen, we surely shall make the greater profit out of the extracted, because less skill is required in its production. Because it is so much easier to raise the extracted and still have a merchantable article, I am constantly thinking on the problem of how to arrange my stock so I can handle as much stock in the producing of comb as one man is supposed to be able to care for; then, in addition, have an equal or greater number to run for extracted. The constant care necessary to get a first-class article of comb necessarily makes one limit the amount of stock he runs; but I have not the least doubt that the time is close at hand when we shall be able to manage as successfully two or three hundred colonies for extracted, as 50 to 100 for comb. The control of swarming will enable us to so increase our output of the liquid honey that we can compete with sugars, and be also a great step toward making of it a staple.

Mr. Editor, if any of your readers have been producing both comb and extracted at the same

time and place, may we not hear from them—at least in brief statements, giving their opinion as to the actual difference in amount of honey to be obtained?

Loveland, Colo., Jan. 25.

[This is indeed a very practical question as well as quite a mooted one. We are constantly being asked by beginners how much more extracted than of comb can be produced, or which is the more profitable. When the question was discussed several years ago the opinions of some of our best bee-keepers conflicted somewhat; but now larger experience and wider observation on the part of all of us will, we hope, enable us to do the subject more justice. We desire that not only friend France but the other prominent bee-keepers will give their experience.—Ed.]

MARKETING EXTRACTED HONEY.

HOW TO GET A TRADE STARTED WITH THE GROCERS; SOME VALUABLE SUGGESTIONS.

By Chalon Fowls.

As I have succeeded in establishing a good home market for my extracted honey, in my own and adjoining towns, selling 2000 to 3000 lbs. every season, I will give a few hints showing what my methods are.

First, to show that it pays better than to ship to a distant market in the city, I will say that last season's crop brought me 13½ cts. on the average, running from 11 to 14 cts. Now, bear in mind this result was not obtained in a single year; but in the course of a few years a good reputation has been gained for a choice article of honey. Of course, nothing is sold under my labels but choice well-ripened clover and basswood honey, ripened on the hives. If I happen to get any dark or inferior honey it is sold at a less price directly to consumers, explaining the reason of the difference in price. I would not let the grocers have it at any price. I put up my honey for families in 1-quart Mason jars, crocks, or any thing they wish; but for

THE GROCERY TRADE,

it is put up in pint Mason jars or jelly-tumblers. A simple 1x2 inch white label is used, giving my name and the word *honey* the most prominence, as it is my belief that the best "display" can be made with the *honey itself*, which I aim to have "clear as crystal," and put up in flint glass. I make a trip once in five or six weeks with a fresh supply, and call on all the grocers; and any cans unsold, that show signs of candyng, are replaced with freshly put-up goods.

I have often had quite a little difficulty in getting grocers to try my honey the first time. I once talked quite a long time with a grocer whom I will call Mr. A. I can remember a part of the "palaver," which ran something like this:

"Your honey looks nice and clear, but it won't stay so."

"But if it candies I'll change with you next time I come around."

"Don't want the nasty sticky stuff around anyhow; leaking and sizzling down the side, and daubing up my shelves."

"But I tell you my honey *won't* sizzle down the side, and I'll prove it if you'll take only a little to try the goods."

"It will be little if any, and that won't pay to bother with."

"But I expect to convince you that my goods are clean to handle, of superior quality, neat, and attractive, and a good seller; and you will soon have a good trade in my honey, which will be profitable."

"Well, I would try half a dozen, but you ask too much."

"None too much when you consider the quality, and that I warrant you against all loss."

After more "palaver" he took half a dozen, and since that has been a regular customer—in fact, he won't buy of any one else, and often handles thirty or forty dollars' worth in a season.

Once, after leaving him a stock of honey, I called on his competitor next door, only to find I could not sell him any, as he had a few cans on hand he had bought of some other party, that were candied.

A month later, when I called on Mr. A. I found the honey had been selling well, and he took some more. Calling next door on Mr. B. I suggested that he would now be ready to take some honey; but he said:

"No, Mr. Fowls, you see I've got this candied stuff yet, and I want to get rid of this first."

"Well, it doesn't seem to sell. You seem to have just about what you had a month ago."

"Well, no; it doesn't sell; it doesn't look nice, and people don't want honey unless it does look nice."

"Perhaps the people don't know what it is. I see it's not labeled."

"Fact! the most of them think it's horseradish."

"Well, I guess you'll have to melt it up, to sell it."

"Haven't got the time. I should be sure to make a muss, get it burned, or something. Let me trade it for some of yours."

"No, I couldn't do that, Mr. B. It's not as good as mine; and if I should sell it again it would hurt my trade."

"Oh! but you could dispose of it somewhere; and I will try your honey, and you will be making money out of me."

"No, sir, Mr. B. When you handle *my* goods you will make a much larger profit than I do. See here; I think I can give you a pointer. Last month when I came around I sold a stock to your neighbor, Mr. A. You would not take any, but said, 'Wait till I dispose of this can-

died honey first.' Well, since then Mr. A. has made \$2.00 clear profit on my honey. If you take my honey, *you* are the one that will be making money. Why haven't you made any thing on honey the last month? You didn't have honey that would sell."

"Ha, ha! I'll give up; bring in a couple of dozen and we'll try it."

I often do quite a little talking to get people to try my honey; but after I get a customer I can usually keep him.

If a man does not buy the first time, I keep coming till he does. If he happens to have a stock of honey bought of some one else, I do not pick a flaw in it; on the contrary, I praise the good points; and if there are any bad ones, the grocer will usually mention them himself on seeing my sample in comparison. I never run down a competitor's goods, even if they are inferior, and "farmers' honey" nearly always is.

I sell quite a little to boarding-houses and families in my own town. I sell small packages of honey the same size the grocers sell, at the same price; but larger quantities I sell cheaper. I called on a mechanic in his shop one day, and, producing my sample, proceeded to strike him for a trade. He at once refused, saying something to this effect:

"No, I never use it; have not bought any for years."

"But your family—wouldn't they like it?"

"Oh! they might, likely enough; but we can't afford it; and as long as they are satisfied with the cheap sugar syrup, I can't afford honey."

"Well, Mr. H., I'll admit honey can't compete with sugar, simply for sweetening purposes; but it's the *flavor* I want to sell you; and I think I could convince you that honey is as cheap as sugar when you take that into consideration."

"Well, you'll have a hard time convincing me."

"I think I heard you speak of buckwheat flour being high. I suppose you have buckwheat cakes at your house these mornings?"

"Yes, sir; there's nothing equal to buckwheat cakes, made the old-fashioned way with yeast."

"And you like the *flavor* of those cakes so well that you pay nearly three times the price of wheat flour to get them!"

"Well, I'll acknowledge the corn, Mr. Fowls; but if I'm extravagant with my cakes I ought to be careful what I put on them."

"So I suppose you put on granulated-sugar syrup."

"Yes; and the children want them just swimming in it too; but it's cheap."

"Mr. H., let me suggest that it would cost no more to put just a little of this fine-flavored honey around on top of them than it would to have it just swimming in sugar syrup."

"Well, you call at my house when you come around with the honey, and we'll try it."

Of course, I sold him some, and he ordered some more in two or three weeks, making 24 lbs. so far. When I asked him if he had tried it yet himself he said, "Why, I have eaten more of that honey than I have eaten before in all my life. It is thicker, finer flavored, and agrees with me better than the old strained honey I tried years ago."

Some of my customers who keep boarders say it is the cheapest thing they can get for sauce. It needs no preparation, will go farther, and is relished as well as any thing.

As compared with maple syrup, a person can usually take only a little honey on a spoon, but will take a whole spoonful of maple, it is so much thinner.

Oberlin, O., Jan. 24.

RAMBLE 102.

SURPRISE PARTY; PULLED BEES: HOW THE RAMBLER AND MR. MOFFAT CAUGHT THE BEE-THIEVES, ETC.

The cabin in which the Rambler now resides in happy single blessedness is large enough for me to spread myself in, and have one spare room besides. It takes three good rooms in which to do the spreading. I find fully as much company here as in the little cabin where I had rattlesnakes and skunks under my bed. The basement of my house is occupied by two cats. The husband cat is, however, absent much of the time. Having, I suppose, set him an example for rambling, he is trying to outdo my best efforts. The wife cat, however, is very contented, and placidly eats my pancakes if I spread them well with 35-cent butter. The attic of my house is also occupied by a family of woodpeckers. They are so much in the habit of pecking around for a living, that, even in the dead of night, their pecking machinery gets to going, and at first it was exceedingly annoying to hear a loud rap, rap, rap, and, upon going to the door, to look out into blank darkness. Knock, knock, knock, again, suggestive of spirits. Wonder whose spirit it is. Then Poe's Raven comes to mind: "Who's that knocking, knocking at my chamber door?" Then the knock, knock, knock, is repeated, and I locate it in the attic, and among my harmless feathered tenants.

A few evenings after locating in this four-roomed house I was having a fine outlook upon the world through one of our San Francisco papers, when another knock, knock, knock, came. This time it sounded so natural that I laid off my specs and went to the door, and there stood the smiling visage of my nearest neighbor. He sort o' unceremoniously brushed

right by me and entered the house, and then another neighbor did the same, and then another; then the women began to swarm in, and I retreated to the further corner of my study; but the neighbors kept coming, and then babies in arms. I almost fainted, and gasped, "Gracious! what next is coming?" Well, it was chairs, tables, and oysters, and then I began to realize that I had been struck by a surprise party. I never had the least objection to being surprised; but in this case, instead of being gradually surprised, the good people all came at once. It was rather overwhelming; didn't know where to put my hands and feet. I gradually *came tu*, as the Yankee said, and told the women to dump the babies on the bed and I'd go out under a pepper-tree and change my wearing apparel. They followed my advice, and the bed was a sight to behold. I got out into the glorious California air, and made for the pepper-tree with my Sunday go-to-meeting clothes under my arm. The cold stars looked down upon me with unpitied rays.

All of my festive young friends, and especially Mr. and Mrs. Clark, took right hold with both hands, so to speak, for enjoyment; and as these good friends were responsible for the surprise, I expected something would soon happen to them, and, sure enough, it was only a few days after that when both were down with la grippe.

The surprise was brought to a close at a time-



ly hour, and all the friends happily went to their various homes. The babies, sleeping peacefully on my humble bed, were rolled in blankets and tenderly conveyed away also. When the last one had disappeared I entered my cabin again, and, after a few reflections upon past times in the far East, I was soon enjoying myself in the land of dreams.

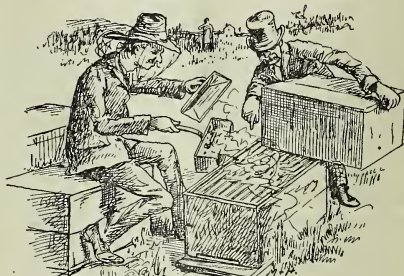
Soon after the occurrences above noted I visited our apiary again to give it a thorough looking-over, for it had been a long time that I had been absent from it, and at such times there are apt to be some colonies that become queen-

less; others will have fertile workers, and others may have been tampered with by skunks, and bipeds that are worse than skunks. So, upon my approach to the apiary, I heard a note that made me hasten my steps; and, sure enough, there was robbing in progress, and several hives were being assaulted. It is the practice here to close the entrances, after the extracting season is past, down to about an inch; and knowing that these were strong colonies only a few weeks before, I was a little surprised to see the vortex of bees whirling around them. Without waiting for veil or smoker I grasped the sharp-edged steel tool that we use to pry open the supers; and the first one that I tipped back I found had been cleaned of its brood-combs, bees and all; and though there was no one within a mile of me I shouted right out, "Pulled bees!" and an examination revealed that 12 colonies had been stolen. The frames from the brood-chambers, with adhering bees, had been removed (pulled), and placed in hives owned by the puller; and a person entering the apiary would miss no hives from their accustomed place.

"Well," said I to myself, "this puller beats the puller of honey;" but I soon changed my mind in that respect; for, when I unlocked and entered the cabin, I found eleven 60-lb. cans of honey missing, and about 20 lbs. of beeswax. All manner of schemes for the entrapment of the thieves were entertained, and finally I resolved to watch nights, or to let the thieves go on in the evil way they had been doing; and by thus giving them rope enough they would hang themselves; and, sure enough, a few evenings after, there came a knock, knock, knock, at my lonely cabin door. It was not the woodpecker in the attic this time, but at the door I found Mr. Moffat, of the neighboring town of Rialto, and a tall lank man. The Rambler, it has been said, is a lank fellow; but this man was extremely lank—much lankier than the Rambler, and he was introduced to me as the chief detective of Rialto.

Mr. Moffat and I compared notes on the pulling business, and we found ourselves in the same boat, Mr. Moffat having lost over twelve colonies also. But Mr. Moffat had the good fortune to visit his apiary the next morning after the pulling, when tracks were fresh, and tracked the wagon to an apiary away out in that brush in which I rambled a few weeks ago. The result was the arrest of several parties, and the Rambler was called upon to go over the ground with Mr. M. and the chief detective, and note points of interest that would be of value in court. The next morning I was in Rialto, bright and early, and with my companion we visited the despoiled apiary. Pony Vix, who is so used to the artistic arrangement of my apiary, pointed her ears with some surprise at the medley of old rattle-trap hives before her. Mr. M. said that he used to take much pride in his bee-hives and grounds; "but,"

said he, "since I came to California, and where I have so much ranch work to do, I neglect the bees; and all I care for them is to extract the honey when it is time to do it. Oh, yes!" said he, in reply to my question; "it pays to have things fixed nice; but I have much else to do." As a consequence, here were some 140 colonies in old unpainted hives, and scarcely a super that fitted close enough to keep the bees in at those points of contact. The hives, being unpainted, were warped so that bees could come out at the corners. Still, Mr. M. had taken eight tons of honey from this apiary. I reflected that, if his fruit-orchard had been neglected as he had neglected the bees, he would have received no revenue from it whatever; but the bees will stand much neglect, and still produce a crop for the owner. I found myself wishing that some one would invent a bee, or change all of our bees to non-neglectable bees, and then see how many would remain in the business.



"Mr. Moffat worked his stew-pan smoker, while I worked the river."

Mr. Moffat doesn't believe in any of the new-fangled smokers, but prefers to use a sort of stew-pan arrangement—a tin box about 5x8, and 6 inches deep, with a loose cover and a long handle. A fire is built in this stew-pan, and any kind of fuel crammed in. It makes a beautiful smoke. If the fire gets too hot, the cover is put on. If the smoke is to be directed over the hive, take the cover in one hand, the stew-pan in the other, and fan the smoke toward the hive with the old flippity-flop cover. I became so interested over this (to me) new smoker that I forgot all about pulled bees or the pullers thereof.

Our examination revealed that the same tactics had been practiced here as in my apiary—the brood-chamber rifled, and the hive left on the stand. Here, however, five colonies had been removed bodily, and we all came to the conclusion that the men in the brush began to think they owned all of the lone apiaries, and were going to remove them to their respective homes. While we were examining hives, the detective was measuring tracks, both of man, beast, and wagon, and picking up pieces of slivers here and there; and one of these that came from, or that was broken from the top of a

brood-frame was carefully wrapped in a rag, and put into the pocket. Mr. M. also called my attention to the way he had put in foundation. A strip of redwood was split from a shake, and the foundation secured by nailing the strip on with shingle nails, the nail-heads standing down a full half-inch. Another point, the frames were old, and many of them had been boiled to remove the foul-brood germs. After a thorough examination in the pulled apiary we drove three or four miles to the pullers' apiary. The puller was gone to hunt up a lawyer, but the women-folks were at home, and came out a little way into the brush to see that we three did not take their bees all away. The owner of this apiary said, only a few weeks before, that he had 30 colonies. We now counted 78; and, considering that our winter has been a little colder than usual, it was a remarkable winter increase. We looked into every hive, and—yes, Mr. Moffat's big shingle nails were there; those boiled frames were there, and those frames with slivers broken out of the top, were there. Mr. Moffat worked the stew-pan smoker, and I manipulated the hives, and the detective held on to his precious slivers, and soon we found a frame whereon the larger sliver or shaving fitted exactly. That frame was removed forthwith for testimony. Besides looking the apiary over for the benefit of Mr. Moffat, I had another object; and that was, to find something that had been pulled from the apiary that I had been managing. After many hives had been looked into I found a frame that I could identify. A little further along I found another. While all the apiaries around this vicinity have about the same size and style of frame, and they are interchangeable from one hive and from one apiary to another, it is impossible to distinguish one frame from another, ten miles away. It was for that reason that the pullers pulled only the frames and brood. But in pulling from the Rambler's apiary there was one style of frame that had an improvement attached to it in the shape of a little inset on the end, and the nailing-together of the frame was such that it could be identified among thousands. Here was, then, the rope that the pullers hung themselves with—the saving of the frames. In handling frames for extracting, there are many little faults on frames that one becomes accustomed to, and so it was here; aside from the two peculiar frames, there were others that I knew came from my apiary. When we departed, the sad-eyed women-folks returned to the little cabin, and we were sure their hands would not have been put forth to steal other people's possessions. The guilty parties, at this writing, are in the hands of the law, and the result will be reported later.

I wish to say to the readers of GLEANINGS who may have read my answer to Mr. Pryal, in relation to matters concerning Southern California, in last GLEANINGS, that I wished to con-

vay no idea that Mr. Pryal had any malice toward this portion of the State, or that he in any way perverted the facts. We have a great State, and even a native Californian, though he may be well posted, and travel much, will find there are things that he may be a little mistaken about, and commit an error in writing about it. That is all that I wished to convey in my answer to the gentleman. RAMBLER.

THE SELF-HIVER, AGAIN.

SOME OF THE DIFFICULTIES; HOW THEY HAVE BEEN OVERCOME.

By C. H. Dibbern.

I have been carefully watching the bee-papers during the last few months for something further on this subject, but so far a strange quietude seems to have settled over the entire matter. It is hardly possible that the matter has been dropped as impracticable, or that nothing new has been learned in the past season. I know that some of our best bee-keepers are somewhat skeptical when a self-hiver is mentioned, and I am not certain that the perfect hiver has yet been invented. I do know, however, that enough progress has been made during the last few years to make its perfection, in the near future, an absolute certainty. When a self-hiver was first suggested I was greatly interested, as I was then thinking of starting an out-apiary; and how to manage swarming without costing all the bees were worth was the great problem with me.

During my first season at the out-apiary my swarmers were constructed somewhat on the principle of the drone-trap, and proved partially successful. There was no trouble in catching the queens in the new hives, with a lot of drones and some workers. I could usually, too, determine at a glance just which hives had swarmed, and by then dividing the bees and combs, and changing position of hives, could make fairly good swarms. While this was not very satisfactory, it was better than to allow the new swarms to escape to the woods, or hire help that cost more than the bees were worth. I have changed and remodeled the hiver many times since, and have been constantly watching for any suggestion that the action of the bees might give me. I have also tested about all the different hivers that have appeared in the bee-journals from time to time, that gave any promise of success.

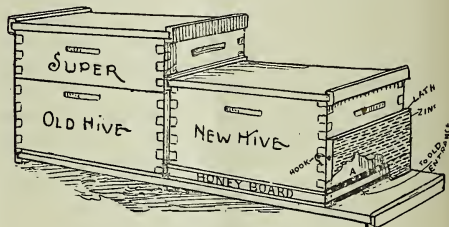
Last year the Pratt was very generally considered as solving the hiving problem; and so favorably impressed was I, that I tried quite a number; but I must say it was with very poor results. As I consider Mr. Pratt one of my good friends who is working on the same lines that I am, for the benefit of bee-keeping, I do not wish to say any thing further against his hiver; but judging from my numerous experi-

ments during four years, I do not see how he can ever make his plan a success.

I will now mention some of the difficulties that I have encountered, and that must be overcome in the perfect hiver of the future. In the first place, the drones are very much in the way; and the only way to dispose of them is to trap them in some way. Where drones are confined in the empty hive with a considerable number of workers, they are fed by the bees at swarming time, and do not die as in a trap. Then every afternoon they make a great fuss to get out, and keep the bees in a constant uproar, and it is needless to say but little work will go on in the old hive. Some bee-keepers seem to have lots of trouble on account of the queens passing through the excluding zinc; but I have had almost none at all, and use only the common sort, as sent out from the Root factory. There is a great difference, however, how the excluders are placed on the hive. If placed on the Pratt principle, with only $\frac{1}{4}$ in. between the top of frames and the zinc, the queens seem to stand on the frames with their hind legs, and push themselves through. In this way I lost several good swarms last year, before I could understand how queens could pass the zinc in that position. When they could not pass it in the ordinary drone-trap. Perhaps this may explain why so many have trouble with the excluder zinc. I have a very few small virgin queens pass the zinc, but that is about all. One point on which bee-keepers have expressed a great deal of fear, and which at first troubled me greatly, was the idea that two or more swarms, coming out about the same time, would double up, and all return to one hive; or, perchance, should some puny virgin queen get out, the whole business would go to the woods. Happily this fear has proved entirely groundless, and during four years' experience I have had almost no trouble at all. I well remember the trouble I used to have "in the good old times" when I allowed the bees to swarm at will, when perhaps the first swarm would go to the highest limb in the vicinity, and, before it could be secured, perhaps two or three more would swarm, and, of course, form one bunch, often as big as a barrel. Now, it may be just fun for some to hive and separate such swarms, but I want no more of it in mine.

The most practical form of the self hiver that I know of is that described by me in GLEANINGS for Oct. 15, 1892. It consists in placing the empty hive in front of the one expected to swarm. My hives are loose bottoms, and strips are nailed on the sides and rear of bottom to make a bee-space under the frames. I remove the rear strip on the bottom for the empty hive, and connect the entrance of the swarming hive with this bottom by means of a bridge made of tin or wood, so the bees must pass out over this bottom. Place a wood-zinc honey-board on it, and the empty hive on that, leaving a bee-space

between the bottom and honey-board, for the bees to work through. The hiver is hooked on in front of this entrance, and the bees pass through the two lower rows of zinc. Above the two lower rows in the zinc is a wooden division, with wire-tube escapes for queens and drones to pass up to the front of the empty hive. The back of the device above the division also contains excluder zinc, with a part with perforations large enough to allow the queen to pass into the new hive, but retaining the drones in the trap. I think it best to get rid of all surplus drones as soon as possible.



Now, when the bees swarm out, the queen and drones will be surely trapped in the upper part of the device; and, if I am present, I simply put a square strip securely against the hiver, shutting off the direct entrance to the old hive, and compel all the returning bees to go into the new hive with the queen. Thus I get a good working swarm in the new hive. Should I be absent, the bees will cluster on the device, where the queen is, and more or less take possession of the new hive. I can usually determine what hives have swarmed by the large number of drones in the trap, and I have then only to cut off the direct entrance to the old hive, with that square stick, which will throw all the workers into the new hive. If it is desired to boom the new swarm, they can be left any time as they are, up to nearly two weeks, when the old hive must be removed to a new place. Of course, the surplus cases should be changed to the new hive at swarming time, or when discovered.

The advantages of my system are many, and must be apparent to all intelligent bee-keepers. In the first place, the bees in their ordinary work pass through but one perforation, in plain sight, and are not liable to become clogged with drones. Swarming can be easily determined by lifting covers, not hives, supers, and all. Drones are trapped where they will die, and can be readily shaken out through a hole at end of the device. The empty hive should be filled with worker foundation; for if many combs are used, the bees seem a little "previous" in taking possession, and store honey there. If only guides are given, the bees often commence to build drone comb in warm weather. All communication is not cut off from the old hive, as the bees have simply to pass up through the honey-board and out. In fact, a good many

bees continue to work in the old hive; and when it is finally removed, all are thrown into the new hive, without any of the Heddon bother. Bees on this plan swarm but little, and it comes nearer being a non-swarmers than the Langdon plan, in my experience.

I have no patent on this device, and, so far as I am concerned, all are free to use it. So confident am I that it is the best plan yet suggested, that I shall adopt it quite generally. Some have objected that an empty hive is required for every hive expected to swarm. Now, the prudent bee-keeper, it seems to me, would always have such hives provided, anyhow; besides, most of us, of late years, have more empty hives than we know what to do with.

Many have ridiculed the self-hiver, but it is a ghost that will not down at the bidding. The advantages of such a device, to the person keeping but few bees, and who is away from home at work all day, must be apparent. Then, too, if children or the ladies are left to look out for swarms, how easy it will be just to put that stick in front of the entrance, and the thing is done! But if no one sees the swarm at all, it will be hived just as certainly, and in almost as good condition.

Milan, Ill., Feb., 1894.

[We reproduce the engraving which appeared on page 765 of GLEANINGS for 1892, in order to give a clearer understanding of the hiver. We may add, that the honey-board separates the two entrances—the one to the old colony, and the other to the empty hive in front, to be occupied by the swarm. The two entrances are likewise separated by a slat, or low ceiling, just opposite the honey-board. The queen, on coming out with the swarm, and failing to go through the perforated zinc, will pass through holes in the slat covered by wire-cloth cones, *a la* Alley. The slat and the cover are not shown in the engraving, but should be represented between the two entrances back of the perforated zinc in front.

Regarding the merits of the Pratt and Dibbern, we would say, that, where there are a large number of drones, the Dibbern will doubtless give better satisfaction. But where all worker-brood foundation is used, as it is in most well-regulated apiaries, there will be so few drones that there will be no appreciable trouble from them. The Pratt worked nicely for us; and as it seems to us to be much simpler in construction and manipulation, we should prefer it, especially in its modified form. Pratt originally had his hiver constructed, one hive in front of the other; but as this necessitated the use of two bottom-boards, the mutilation of one of them, a "bridge" to connect the two hives, and a perfectly level plot of ground (a condition that does not always exist), he adopted the form of one hive over the other. Dibbern's hiver could be constructed on the tiered-

up plan as easily as Pratt's, and we would suggest that friend Dibbern try a few that way.

We want to say amen to his last paragraph.

—Ed.]

CALIFORNIA STATE BEE-KEEPERS' ASSOCIATION.

By J. H. Martin.

Quite a number of bee-keepers were seen concentrating toward the Chamber of Commerce, in Los Angeles, Jan. 23d, and King-bee J. F. McIntyre rapped the meeting to order at 10 A. M.

The usual routine of business was attended to, and the regular program was taken up. Mr. Francis W. Blackford, of Saugus, presented a paper entitled, "Is the Honey-bee in California the Fruit-producer's Enemy?" Mr. Cory then presented a paper bearing upon the kindred subject of bees and fruit-drying. During the discussion which followed it was suggested that the fruit-trays be covered with cloth; but inasmuch as, in the drying of fruit in large quantities, the spread is several acres, it was figured that an acre would tax the fruit-dryer to the amount of \$121 per acre for cloth. It was considered as an expensive measure, and the subject was dropped without a suitable remedy being found.

AFTERNOON SESSION.

The various restaurants around the Chamber were well patronized; and, from the happy remarks that fell from the various representatives, they were well taken care of by the caterers to the needs of the inner man.

President McIntyre read his annual address, and touched upon various points of vital interest to the bee-keepers of the State. These points were afterward acted upon by the various committees.

Mr. Cory, in a brief paper, considered tare on honey cases and cans. It was the sense of the committee that tare should be allowed only on the case. More tare was exacted than the weight of can and case allowed. Mr. Mendleson claimed that he lost 1438 lbs. on his honey crop by this unjust tare.

Mr. Brodbeck very happily called his paper a "Medley," and touched upon several subjects.

The Ventura hive came in for a share of discussion. This hive has been the standard hive for Ventura Co. for several years, and the bee-keepers of that county would like to make it the standard for California. Seventeen, mostly Ventura Co. men, voted that way; and as there was no opposing vote, although there were over 50 persons present, we have no doubt Ventura has set the pattern, and made it a standard for the State; size of frame, top-bar, 19¼; bottoms, 17½; end-bar, 8½.

After the standard hive was adopted, Mr. Mercer, a Ventura man, kicked over the traces, so to speak, and advocated a shallow divisible

brood-chamber. Mr. Woodbury came up smiling, as the pugilists say, and supported him; and Mr. Rowley spoke right out in meeting in favor of the Heddon hive. The secretary dittoed the gentlemen, and was followed by Mr. Compton, who had been a foreman in Mr. Heddon's apiaries. He strongly advocated the divisible brood-chamber. Mr. Corey, however, preferred the good old way of handling frames and dummies, and the discussion branched off into a question-box, which brought out many valuable hints.

EVENING SESSION.

The evening session was opened by Mrs. Moffat singing "Simple Little Ostrich, I Know it All." The theme did not apply to bee-keepers present, for, of course, the "know-it-alls" do not attend conventions. Mrs. Moffat rendered other songs during the evening, which were heartily applauded. Prof. Cook made everybody happy by his appearance, and, after a few happy remarks, read an address upon the bee-keeping industry of California. Prof. Cook is thoroughly established in the college at Claremont, and will take a lively interest in the promotion of the bee-keeping industry of the State. He will probably establish an experiment station at Claremont, and the association passed resolutions to further that end.

The adulteration phase was taken up and handled without gloves, and a resolution was passed directing the expelling of any member of the association found adulterating honey.

There was some forecasting in relation to the honey-yield for the coming year. The yield depends upon the rainfall; and the more rain up to May, the better will be the yield. Several averages were given for a series of years, wherein it was found that about every other year is a failure in some portions of the State. Giving 100 lbs. per colony was considered a poor season, while 400 lbs. was called best.

SECOND DAY.

The morning was taken up with reports of the various committees. The most vital point in these reports was in relation to marketing of our product. A committee was appointed to correspond with the California Fruit Exchange, with a view to having representation in the organization. It was further recommended that the producers put their honey in small cans that it may reach the consumer in the original package. Put up in 5 and 10 lb. cans, the honey would not be adulterated so much.

Mr. G. B. Woodbury presented a valuable paper, "The Fruit Nemesis; or, What shall we Do to be Saved?" A special vote of thanks was given to Mr. W., and he was appointed a committee of one to select points from his paper in relation to the value of the honey-bee in its office of pollenizing fruit-trees, and to have the same published for general distribution.

How can bee-keepers best advance their in-

terests? was then treated by W. P. Richardson. Prof. Woodworth, of the State University, explained a hive of his own devising. The main principle was the use of $4\frac{1}{4} \times 4\frac{1}{4}$ sections, not only for obtaining surplus honey, but the same sections were used for brood-frames. The idea may be a good one; but the practical men present did not enthuse much over the new idea.

Prof. W. stated that the State Chemist, Prof. Rising, was ready to aid bee-keepers in the way of chemical analysis.

The election of officers resulted as follows:

Prof. A. J. Cook, President; J. H. Martin, Sec.; J. F. McIntyre, Treasurer. Several vice-presidents, etc., followed.

The final paper, by Mr. Touchton, "Twenty-three years Among the Bees," was read, and the association soon after adjourned, making provision for a special meeting at the mid-winter fair in San Francisco, at such time as the Executive Committee shall designate.

J. H. MARTIN, Sec. J. F. MCINTYRE, Pres.



INVENTIONS.

WHO SHOULD HAVE PRIORITY, AND THE RIGHT TO USE? KEEPING TWO QUEENS IN A HIVE TO PREVENT SWARMING.

By B. TAYLOR.

Friend Root:—In GLEANINGS for Nov. 15, and in the same for Dec. 15, are several articles on "Two Queens in One Hive." One of your correspondents seems to be greatly disturbed by the thought of my getting a patent on two queens in a hive. I wish to say here that I do not believe in the present patent system as a just and wise method of rewarding inventors for useful improvements in needed inventions. I do not believe that any one person ever made an entirely *new invention* in anything. A little thought on the subject will convince any rational mind that the perfection of machinery enjoyed in the present age is a thing of slow growth rather than sudden creation. Each inventor receives his inspiration and starting-point from something that others have done before him; and I am quite sure that every inventor, if he will examine himself and his inventions, will find that something already done started him in the search for improvement. We talk of McCormick inventing the reaper, Howe the sewing-machine, Morse the telegraph; but informed persons know that all these machines had been brought nearly to practical perfection before any of these truly great inventors were born. Yes, sir; every instrument that was ever invented to harvest a

sheaf of grain, was a part of the work in making the self-binding reaper. Useful inventions, then, are a part of the growth and experience of the race, and no one man should be permitted to seize any thing that was made possible only by the work of past generations, and tax the coming generations for their use. In the coöperative commonwealth that I am more interested in than in any other one earthly question, inventors will be paid for their work from the public treasury, and all inventions will be free to the people; but until the better time comes, we must use such laws as we have or nothing; and those who use them so as to get some reward for their time in experimenting should not be blamed for so doing. Now to the question of

TWO QUEENS IN A HIVE.

Early in the '80's I commenced experiments to control increase. The first move was to make a large number of stands, large enough to hold two hives. In the spring I placed one hive on each of those stands. When the bees swarmed they were hived in one of my small hives placed where the old colony stood. The old colony was moved to the other end of the stand, with its entrance turned in the opposite direction. This gave all the flying bees to the swarm, and made them strong for gathering surplus. The old hive was given a young queen, and would in nearly every case be strong and heavy by the end of the white-honey season. At the end of this the queen was removed from the swarm, and the two hives were set together again as one colony. This plan worked well, and I extended my experiments until it culminated in the revolving stand, eight years after. The revolving stand revealed the fact (new at least to me) that two queens could be kept in one colony, and I at once saw, as I thought, the possibility of using it as a means to prevent swarming, and at once began work in that direction. And now, friend Root, I will say here before going further, that, until I had demonstrated that this could be done (that is, two queens be worked in a single colony), I never heard, either by print or speech, a single suggestion of the possibility of doing this thing. I know that there had been accounts of two queens being found temporarily in the same colony under accidental circumstances; but that two queens could be *worked* there *permanently*, and at the will of the apiarist, was a thing that I had never even heard mentioned, and I think I may be excused for claiming priority.

The Wells plan, as mentioned by Mr. Cornell, seems to be nearer my method than any thing else I have seen yet. It is quite different, and was never intended to regulate swarming. I know from my own experience that a division-board of perforated zinc, as used by Mr. Cornell, would not do. His account of his experiments is a plain straight story; but it in no

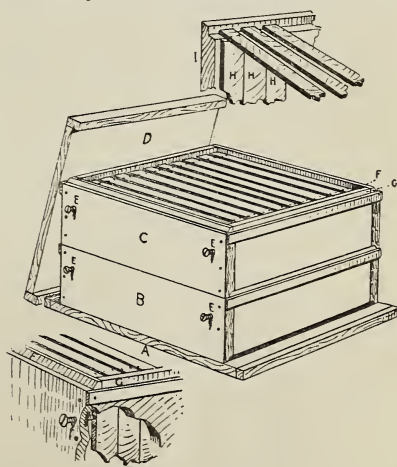
wise covers my plan. His advice, not to spend much money in this direction at present, is entirely in harmony with my own, for you will remember that I said, long ago, that I should not offer any thing for sale or experiment until I was sure I had something useful to offer.

[Mr. Taylor is quite correct. We are mutually indebted to each other, and it is a sad comment on our U. S. patent system that some inventors, having made a slight improvement on an old idea or a set of ideas have been able to get a patent, covering not only the improvement but the old ideas in connection with it. We do not wish to say that it is generally done, but it has been done under important patents recently expired. Neither do we wish to be construed as saying that we denounce our patent laws; but we do agree most heartily with Mr. Taylor in thinking that no one man should be *allowed* to gobble up in a patent the fruits of others' brains.

Along with the above article came a private letter calling attention to a hive Mr. Taylor had sent. That you may all see what the hive is like, we take pleasure in showing you cuts of it.—ED.]

TAYLOR'S SECTIONAL BROOD-CHAMBER.

I shipped you yesterday, from Spring Valley, one of my shallow-brood-chamber hives. The hive sent was one of a lot made for my own use, about 1883, and is the precise kind I have and still use. If you will set each section on a separate bottom you will see the reason for the bev-



eled rabbeted sides; viz., to always maintain a bee-space, whether of a single piece or two or more of them together, both on top and bottom, as well as between each section.

I still think this hive has as few loose parts, and is equal or superior to any other hive yet brought to notice.

B. TAYLOR.

Forestville, Minn., Jan. 4.

[For a fuller description of this hive, see

GLEANINGS, May 1, 1890, page 324. This is practically the same hive he made as far back as 1863. These were shallow, and had originally, if we are correct, closed-end frames. In 1866 he had the sides beveled as at F, not to keep out wind and rain, but to give the proper bee-space, whether tiered up or sitting between the bottom-board and cover. The dimensions are $7\frac{1}{2}$ inches deep, 16 inches square. The frames are Hoffman in style, $6\frac{1}{4}$ inches deep and $13\frac{1}{2}$ inches long, and have a bee-space back of the end-bars. These supers, with the exception of the bevels, the thumb-screws, and the square shape, are quite like our dovetailed supers with Hoffman frames for extracting.—ED.]

FIXED DISTANCES.

SOME TELLING ARGUMENTS IN FAVOR OF THEM.

By Dr. C. C. Miller.

On page 55, Mr. Editor, you have allowed Jno. G. Corey to make a personal attack on me, and I hereby challenge the said Jno. G. Corey to mortal combat. Distance, three paces; weapons, smokers. Tobacco as fuel barred out. I to stand back to the wind. Now, Bro. Corey, I'd do a good deal to accommodate you, but I must draw the line at continuing to use loose hanging frames indefinitely. You seem to think that, if I had frames made by a good carpenter or mill man, and put together like yours, I'd be all right.

Well, I'll tell you about my frames. The first lot of those now in use were made by Vander-vort, the foundation-mill man, and the rest by the G. B. Lewis Co.; and if you think either of them can't "hold down a job," I'd like to see you trot out the "wild and woolly West" man that can beat them. As to putting them together, I may quote your own words, and say, "With the clamps we use to hold our frame material while being nailed, and with 8 nails in each frame, they pile up as true as dressed lumber, and are a correct mechanical job in every sense." Yes, sir, the stuff was cut out by the most expert workmen, then nailed while held with an unyielding grip in a clamp, every frame a model. But the trouble is, they don't stay so. Do yours? Or have you tight bottoms, and never had a chance to look at a lot of bottom-bars after being in the hive ten or twenty years?

As to the why of frames hanging out of true. I must confess that, according to any reasoning in advance, I should not expect as much variation as the facts show. The editor suggests little lumps of propolis under the bearing surface of the top-bars. There may be something in that; but it can be replied that, through the summer, at the time the frames are handled, propolis is soft enough for any little lumps to be squeezed out from under the bearing surface of top-bars. I am inclined to credit most of the

being out of true to the warping and twisting of top-bars or end-bars. There is very little wood that will remain permanently true when left without constraint, especially when, as the editor hints, it is subjected to the moisture of the hive, that moisture not acting uniformly upon all parts. The twisting of stuff shows very plainly in flat hive-covers. Made of clear pine 14 inches wide, it is a rare thing to find one attain any degree of age without being twisted to some extent. If a top-bar 1 inch wide in a Langstroth frame twists $\frac{1}{32}$ of an inch out of true, unless I mistake in figuring, the bottom-bar will be thrown more than a quarter of an inch out of true, and $\frac{1}{16}$ variation in top-bar will make $\frac{1}{2}$ inch in bottom-bar. If an end-bar be cut so that the wood of one side be nearer the heart than the other, the two sides will not act alike in aging, thus throwing the bottom-bar to one side. Occasionally it may happen that top-bar and end-bar will combine to operate in the same direction, and then the difficulty is aggravated. If one bottom-bar is thrown to one side, and its next neighbor to the other, then the trouble will be multiplied, resulting in a distance between the bottom-bars all the way from an inch down to their touching together, and being glued by the bees through a fourth of their length.

But now let us admit that frames are all made true, and that in your delightful climate they remain true for a lifetime. Have the top of the hive stenciled, as you say, showing a black mark for each space. That black mark will help at least this much, that, when you have put in all your frames, you will not find the last one a quarter of an inch out of the way. Indeed, by being careful there need be no *great* variation anywhere. But right there's the rub. That being careful takes too much time. Admit that you can put a top-bar right at your stenciled mark in as short a time as I can push a shouldered frame to its place, and it will then take you twice as long, for you must look at the stencil to use it, and you can't look at both ends of your hive at the same time, unless you have a terrific squint in your eyes. But having two hands, I *can* push at both ends at the same time.

But it can not be truthfully admitted that you can put one end in the right place as rapidly as I can. I mean you with the loose frame and I with the other. It takes *time* to place the frame within a thirty-second of an inch of the right place, and still more time to put it just exactly with the stencil-mark. And remember that a very little variation counts when we are trying to space against brace-combs. If $\frac{1}{4}$ inch is the right space between top-bars, push the first frame $\frac{1}{32}$ of an inch toward the second, and the second $\frac{1}{32}$ toward the first, and you may rely on the bees to fill the space with bee-glue.

Let us, however, look at what will actually occur sometimes. All the frames have been

moved, and all are to be put back exactly in their right places. If there are eight frames, you have just 16 operations to perform. You must look at each end of each top-bar, and set it to its place, and you can't do it with a jerk either. I can push the whole business up at one operation, and I've no need to be careful either, for I can't push a frame beyond its right place.

As you say, when you want to have your frames at fixed distances, ready for moving, you can put in spacing-sticks in a short time. But however short that time, in just that much less time can one be got ready that has the shouldered end-bars, for they're always ready.

So, as it now looks to me, no matter how the frames are made, I still need the fixed distances, and I don't see how I can follow the advice in your "finally" to have my frames made better than heretofore, for I don't believe the thing can be "did."

But that last sentence of yours hurts my feelings, where you talk about my "new-departure hive." Why, bless you, I'm not trying to make any new departure—just trying to get the best of the old. About the only change I have asked in the Dovetail is to go back to the old form of the frame, both as to top-bar and end-bar.

I'll make friends with you, however, and join with you in pitching into the editor for putting that heading to your article, "Exact Spacing not Necessary." He ought to know very well that you didn't hint at any thing of the kind, but only claimed that you could have exact spacing with the old loose hanging frame. I give up that I can't.

Marengo, Ill.

[We meant that Mr. Corey considered "exact spacing unnecessary" by mechanical devices forming part and parcel of the frames themselves.—ED.]

A GOOD POINT IN FAVOR OF WIDER TOP-BARS.

Seeing a call in GLEANINGS for reports on this subject, I will give you my experience. Two years ago I left an order at one of our hive-making establishments for 3000 frames of the modified Hoffman type, with $1\frac{1}{32}$ -in. top-bars; but through some mistake the top-bars were cut $1\frac{1}{8}$ wide. We cut 2000 down to $1\frac{1}{32}$, the remainder we nailed up and used as they were cut by the manufacturer—namely, $1\frac{1}{8}$ wide by $\frac{1}{2}$ in. thick. I find on those that are $1\frac{1}{32}$ in. wide, plenty of burr and brace combs, while on those that are $1\frac{1}{8}$ in. wide I find but very few burr or brace combs. Now, give me a top-bar $1\frac{1}{8}$ in. wide by $\frac{3}{8}$ in. thick, spaced $1\frac{1}{8}$ from center to center, with $\frac{1}{4}$ in. between tops of frames and sections, and I will show you hives without burr or brace combs.

T. R. CANADY.

Fallbrook, Cal., Dec. 25.

[The result of this experiment is quite interesting, inasmuch as it is quite accidental, and

quite contrary to what friend Canady expected. Now we should like to ask, Would it be desirable to have wider tops, but thinner than we now make them?—ED.]



CONTROLLING SWARMS.

A young friend of mine, a recent bee-convert, recently complained to me that, out of five swarms the past season, three had gone off directly, and the other two had gone some distance and alighted in most inaccessible places. This record appeared so remarkable to me that, on the young man's assurance that the people who had lived on the place before him had experienced the same bad luck, I went to look at his hives and explain the cause.

As soon as I caught sight of the place I was more puzzled than ever, but at my friend's lack of foresight. Not a tree, bush, or vine—not even a fence within many rods of the hive.

"My dear sir," I asked, "where did you expect them to alight?"

"Why, I don't know," said he, looking around for a possible roost.

"Which is precisely what has ailed your bees," I added. "They had to start away to find an alighting-place, and, when once started, found it inconvenient to stop at all."

I don't suppose there are many who are guilty of such ignorance as that, but there are comparatively few outside of the professionals who give the matter the attention that should be given. Times without number, almost, I have seen people climbing trees and out on limbs after a swarm that had lodged some place where they would not have allowed their small boys to go for a captive kite. "He might have kept his kite out of there." You might, nine cases out of ten, have kept your bees out, too, even though you did not see them start.

There is quite a general idea that, in the absence of some special appliance for their capture, a swarm of bees will alight pretty nearly where they please, about all the effort made to regulate their course being the antiquated tin pan and dipper process still more or less in vogue. It is necessary to become neither a squirrel nor a lunatic to keep bees. Watch two successive swarms that come from the same or adjacent hives. At first their course is almost identical, and an arrangement set for the convenience of the one would very likely be as agreeable to the other. But bees are not always willing to alight on the sharp end of a stick, nor even on the patent appliances for that purpose. Give them a good old grapevine trellis just before their door, and they are pretty sure to take the invitation to rest. Where but few

hives are kept, these can be placed in one or two rows, all facing in one direction, and a single trellis before the row will do for all. Where too distant there is danger of their rising above it and taking some other course. If too close it interferes with their flight when at work. A little attention to their usual distance from the hive before showing an inclination to alight will locate the most favorable position surprisingly accurately. An apiary with which I am familiar in this neighborhood consists of three rows of hives facing the south, and a long grape-trellis about fifteen feet in front of the first row. In several years the hives have been there, only one attempt to fly off has been made, and only that one swarm failed to alight in that vine, from which they could easily be reached and taken from the ground.

WILDER GRAHAME.

UNCAPPED HONEY CANDYING; QUEENS IN UPPER STORIES; THAT SCRAPING-KNIFE.

Dr. Miller thinks me in error on candied honey from evaporation. The honey-flow here is very irregular, and, in consequence, I have throughout and at the close of the season a large number of uncapped partially filled cells. The honey in these always candies with me. This may be owing to the source of supply, as sage honey is said to not candy; but for twelve years past it has candied each year for me.

Dr. M. once thought there was "something peculiar" in my statement that the queen went up into the supers and laid eggs in every section of honey; but I have met other bee-keepers who have had the same experience.

The good doctor also objects to my section-scraper, as the widths of the sections are not alike; but the present uniform thickness of all sections will remedy that. Scratch away, Dr. M., but give us your wheat, when uncovered, for our chaff.

FOUNDATION, OLD—HOW TO MAKE IT GOOD.

Each season I have left over a lot of foundation. This gets hard, brittle, and dead-looking by the next season. It loosens from the sections, and drops down, or the bees gnaw it out, and it is next to impossible to make it stick to a section. I now cut this in pieces the size wanted, lay these on a board singly, put the board out in the sun, and watch it. In a minute's time the foundation changes its color to that of fresh foundation; and while warm it fastens very nicely to the smoothest sections. In the absence of sun heat I lay my board on the stove and remove the foundation as soon as its color changes, as the board gets hotter all the time and melts the comb.

E. H. SCHAEFFLE.

Murphys, Cal., Jan. 18.

CLOSING UP THE ENTRANCES TO RETAIN WARMTH IN SPRING; A GOOD IDEA.

Mr. Root:—Most bee-keepers have but little trouble in wintering their bees; but spring is where the trouble comes in, especially when

bees are wintered in the cellar; but for the benefit of those who winter in the cellar and set their bees out in the spring, cold frosty nights have got to be contended with, and it is quite a bother to shut up the entrance at night and open it again in the morning. Now, I will just tell you how you can shut up 100 hives in ten minutes, and the bees will open the entrance when it is warm enough to fly. Take a half-bushel basket or a pail of dry sawdust, and throw a handful at the entrance of the hive so it will close it entirely—no danger of smothering. There will enough air go through the dust to keep them alive. Now, when it warms up next morning see how quickly the bees will clear the dust away and go to work. I have frequently hitched up a horse and gone five miles to shut up an out-apiary of 100 colonies, frosty nights, the last of April and the fore part of May. You will readily see, if I had closed the entrance with a block it would have necessitated a trip there the next morning to open them. We all know the trouble that might arise from chilled brood. A cold wind will blow into a hive, and chill the brood, and do as much damage as it would to a gardener or a farmer to have his corn frozen off.

W. L. COGGSHALL.

West Groton, New York, Jan. 16.

THE ZINC AND THE FOOTNOTES JUST RIGHT.

I wish to give my vote on the zinc question; also on the "everlasting footnotes." The zinc ^{100%} is just right for me, and the footnotes—well, I indorse Dr. Miller's views, even to the word "perfection," which the editor left out. The footnotes are the right thing in the right place; and while the editor never fully agrees with me, I would not have them left out for any thing.

A. C. MITCHELL.

Enfield, Ill., Jan. 26.

[We have received hundreds of kind letters like the above. We can not, of course, give place to them all, but we hereby acknowledge our sincere "thank you all."—Ed.]

PAPER-SHELL PECAN-NUTS.

By this mail I send you a pound of these nuts. They have the distinction of being served at the royal table, Windsor Castle; and although as yet I have not been able to get a testimonial from the queen I have some nice letters from other persons of distinction. Don't plant these, but let Mrs. Root and the children finish them. Should it happen that you want some for planting I shall have to charge you the same as every one else—\$1.00 per lb. These are cheap at this price, for planting; but I fear you are living a little too far north. I have a letter before me, saying that my pecans took the premium at the World's Fair. I am writing to find out more about it.

E. E. RISIEN.

San Saba, Texas, Jan. 17.



SQUARE FRAMES, ETC.

Question.—Could we not adopt Layens' plan of bee culture by replacing in his hive a style or size of frame, say $14 \times 12\frac{1}{2}$, or by using Dadant's size of frame, $16\frac{1}{2} \times 10\frac{1}{2}$, and still make a success of it? What do you think of the square frame? I am assured by men of experience that the Langstroth frame is not deep enough for the cold climate of Canada.

Answer.—If I have ever read of Mr. Layens' plan of managing bees and about his hive, I do not now call it to mind. Who of the readers of GLEANINGS can tell us something about it? But be his plan whatever it may, I wish to say this—that there are few if any frames now in use but that a man or woman of energy, and love for bee-keeping, can take and make a success with them. I believe in always having the best appliances, so far as may be; but I wish to put emphasis on the fact that it is the *man or woman* which puts the success into a thing, primarily, and the best appliances come in as a secondary matter. Although I have been an advocate of the Gallup, or square form of frame, all my life, still, as I have said before in print, if I had 50 colonies on any style of frame now advocated by as many as 20 practical apiarists, I would not consider it a paying job to transfer them to another style of frame, provided the hive containing these frames would accommodate the style of surplus arrangement which it was necessary to use, to place my honey on the market in the most marketable shape. No, no! It is not *all* in frames, as some assert, but it is in the man or woman with energy, push, and real worth enough to surmount every obstacle that stands in the way, and make a success of a thing in spite of a few minor hindrances. Look at Mr. Terry. Had he gone on to a rich fertile farm, instead of a poor one, he probably would have arrived at the same wealth sooner; but his success would not have been greater than now—perhaps not as great—and, in all probability, the world would not have been benefited nearly as much as it has been; for the overcoming of that obstacle in the shape of a poor farm gave a certain "vim" to the success that led him to tell others how it was done, and in this telling has come the greatest light to the world. Reader, if you find a difficulty in your way, and succeed in overcoming said difficulty, don't keep the matter hid, but tell us about it, and thus help the world. Don't be foolish enough to say, "no one will pay me for the telling," for that is a selfish spirit, and selfishness *never* pays; for in doing some kind act, or in trying to lift the burden from some tired shoulders, comes a wealth that money can not buy.

Now a word about a square frame for the cold climate of Canada. In most of the localities in Canada where bees are kept, the mercury does not go lower than it does here in Central New York. As the older readers of GLEANINGS know, I have gone over this ground of a shallow frame like the Langstroth not being suitable for our cold climate, many times. Bro. Root and myself had several tilts over the matter away back in the early seventies; and I still think there are some few things in favor of the square frame where bees are to be wintered on the summer stands; yet, as I said above, if I had 50 colonies on the Langstroth frame I should consider it a losing job to transfer them to a square frame, hoping for better wintering after they were on the latter. Since I purchased my out-apiary, the same containing Langstroth hives, I have modified my views to a great extent, and here wish to ask Bro. Root's pardon for not smoothing off the corners of some of my assertions more in our controversies of the past. Where bees can be wintered in the cellar, the Langstroth frame is not required to take off its cap or make a bow to any of the others, even in cold climates; and in a climate where bees have a chance of flying every two or three weeks during winter, no one has any occasion for looking for a better frame.

OLD OR NEW BEE-HIVES.

Question.—Will bees stand the winter as well, and be as healthy in old hives, or those having been used several years, as in new ones?

Answer.—When I first read this question it seemed to me that the proper answer to give would be this: Old hives in a good state of preservation, with no decayed spots and no open cracks, should be as good as new ones for wintering bees, and the new ones as good as the old; but after thinking a little I am not so sure about that answer. Years ago I found out that a single-walled hive painted on the outside would not winter nor spring bees nearly as well as an unpainted hive, on account of the moisture evaporated from the food of the bees not being able to pass through the pores of the wood, as was the case with the unpainted hive, this causing a dampness about the bees and on the combs which was not in accord with the best welfare of the inmates of the hive. All old hives, after long use, become so varnished with propolis on the inside that this places them in a condition similar to hives painted on the outside; and in cases where the slow passing of moisture out of the hives was not provided for by way of chaff or sawdust cushions, etc., I should expect that the bees would winter best in the new hives. But there is an item generally favorable toward the old hives, which is, that they are more likely to contain old combs; and it is generally conceded by all practical beekeepers, and was given to the public away back in the fifties, by Quinby and others, that other

conditions being equal, bees will winter better on old combs than on new. This I have found to be universally true.

BEES AFFECTED BY MOISTURE.

Question.—Does moisture affect bees wintered on sugar-syrup stores in the same way it does those wintering on honey?

Answer.—That depends altogether upon where the moisture is—whether a damp outside air, damp cellar, or moisture in the hives. From the past few winters' experience, I think that bees winter best in a moist—yes, almost wet—atmosphere, and I do not think that a foggy misty winter has any deleterious effect on colonies wintered on their summer stands. The moisture which has accumulated up to the present time in my bee-cellar stands in drops and runs down the stone flagging overhead, to an extent sufficient to form little pools in the depressions on top of the side walls of the bee-cellar, and yet the bees appear to be wintering perfectly. It is so damp inside, that, should this winter prove as usual, mold will soon begin to form in different places; and by the time the bees are set out in the spring, some of these patches of mold will be as large as, and stand out like, the crown of a hat; still the bees have wintered well in this cellar, with the exception of the year I kept the oil-stove in there.

Inside the hives, the combs, bees, and all, seem to be as dry as when set in the cellar; but were dampness to collect on the combs and walls of the hives, about the bees, or run down on them, I should then have fears of injury. As to the stores, I believe that sugar syrup does not attract moisture as does honey. Honey seems very susceptible of moisture—in fact, more so than any other liquid with which I am acquainted.



SOME INTERESTING FACTS FROM MRS. HARRISON.

While *en route* for my winter home at St. Andrew's Bay, Florida, the sailing vessel in which I was a passenger was becalmed in Santa Rosa Sound. My traveling companion and myself went on shore, and were hospitably entertained by a bee-keeper residing there. It was the 11th and 12th of January, and bees were busy working upon mulberry and peach bloom. There were about 40 colonies of bees, in tall box hives, from 10 to 12 inches in diameter. Our host preferred them from 12 to 15 inches, but he was not always able to get boards of that width. About 30 swarms the past summer were allowed to go to the woods. As there was no market for honey, his neighbors brought their pails, and honey was cut out of the tops of the hives and given to them.

Our host said that he had the large yellow bee of the South. I was all attention and curiosity at once. I went to the hives and watched the bees carrying in pale-yellow pollen. I caught a bee and examined it through a magnifying-glass, and could see no difference in any way from the common brown or German bee. I told my host so, and he said they were called the large yellow bee of the South. They had a small black shiny bee that was very spiteful.

Peen-to peach-trees have been blooming since October. A friend gave me to-day a peach larger than a pea, and the bees were working upon bloom at the same time. It is surprising how long bloom lasts in this climate. A cluster of bloom on a scarlet geranium has not apparently changed one particle. It is blooming out of doors.

MRS. L. HARRISON.

St. Andrew's Bay, Fla., Feb. 1.



Thou hast been faithful over a few things, I will make thee ruler over many things.—MATT. 25: 21.

THE election of officers of the Bee-keepers' Union shows that they were all re-elected. It is well. This makes again R. L. Taylor, President; G. M. Doolittle, First Vice-president; Thos. G. Newman, General Manager.

"EVERY thing is chuck full"—so says Barney, the boss printer. We have been obliged, in consequence, to leave out two or three of our regular departments; and this in spite of the fact that this journal numbers 52 pages. We even had to squeeze to get this in.

MR. NEWMAN, editor of the *Illustrated Home Journal*, has this to say regarding the recent improvements made in this journal for the current year:

Bro. Root has made a great improvement in GLEANINGS for 1894 by "leading" the matter, making it much more pleasurable to read.

In the *Review* for February is an excellent article by R. L. Taylor, on "Foul Brood: its Cause, Detection, and Cure." After having read it over carefully we do not hesitate to indorse every line of it. It is surprising how closely it agrees with the statements we made on page 539 last year, respecting this disease, and yet Mr. Taylor's conclusions were reached over a different route. We feel now more than ever, as touching this disease, that what we know we know.

THE report of the proceedings of the N. A. B. K. A., 24th annual convention, held at Chicago, is at hand. It is gotten up in fine style, and is profusely illustrated with portraits of the au-

thors and some of the leading bee-keepers of the country. It also contains engravings of a large number of honey-exhibits at the World's Fair. Bro. York is to be congratulated upon its fine appearance. Price 25 cts., and can be obtained of Geo. W. York & Co., 56 Fifth Ave., Chicago, Ill.

THE symposium in this issue will bear careful reading—the whole of it. We would call attention particularly to the articles by J. E. Crane and Allen Pringle. As some of Prof. Cook's evidence is questioned a little bit by the negative, we shall be glad to have him reply. With this exception we believe it would be better to bring the discussion to a close until fall.

The evidence we have collected in the two journals will be put in pamphlet form, and will make 16 pages like this. We shall be glad to furnish them to bee-keepers at the cost of paper and printing; namely, one cent each. The distribution of these pamphlets, where ignorant prejudice has been making trouble, will do a world of good. Next fall we will revise it.

BASSWOOD HONEY AND BASSWOOD TIMBER FOR THE RISING GENERATION.

WE are just now getting in some of the nicest and whitest basswood plank that we ever had; and by way of explanation the farmers who are bringing it in say that it is from young timber that started up from the stumps where they cut down basswoods for us 12 or 15 years ago; and we think it is true, that basswoods are of that peculiar nature that, when an old trunk is cut off, and the sprouts are given half a chance, a basswood forest will be perpetual. The whole strength of the mighty stock of roots is given to the young shoots. Who has not seen them start up, and in a few months attain the size of a hoe-handle or larger? One of the conditions is, that stock be kept out of the woodland, and the growth of underbrush be encouraged so that it will be damp and shady where the young shoots start out. A low wet piece of ground is, as a rule, also more favorable. A little observation will show you what is needed to grow in this way basswoods for honey and for timber.

PARAFFINE AND FOUNDATION.

OUR attention has just been called to the fact that a representative of the Standard Oil Co. (a Mr. Schumacher) called upon the Goold, Shapley & Muir Co., of Brantford, Ont., and endeavored to sell them refined paraffine wax for the purpose of making foundation, and represented that the leading manufacturers of comb foundation in the United States were using the article. When further questioned about it he promised to send a letter giving the names. He did so; and the Goold, Shapley & Muir Co. kindly sent us the letter from the Standard Oil Co., under date of Feb. 7, 1894, from Cleveland, O., in which it is intimated that we use paraffine wax for that purpose, and that we bought of

them. They did not state it as a positive fact, but say they *think* we do, though they have not looked up the records. The facts are, we do purchase of that company, about once in three or four years, a small case of paraffine wax—about 300 lbs. We advertise and sell it to melt in small quantities for paraffining barrels for shipping honey; and we also use small quantities ourselves for paraffining the candy-holes in queen-cages. The melting-point of paraffine being much lower than that of beeswax, it is much better for that purpose, but we never sell it for foundation purposes.

Now, replying to that charge we would say we have not used any paraffine in foundation for nearly twenty years, and even then in a very small way. We soon found, as did others at the time, that it was entirely unsuited for the hive. As to the other manufacturers of comb foundation in this country, we can speak quite as positively for them as for ourselves that we *know* they do not use any paraffine in foundation.

The representations of the Standard Oil Co., through Mr. Schumacher, amount to little less than libel, and we have written to them for an explanation. Messrs. Dadant & Son, Mr. Hunt, and the W. T. Falconer Manufacturing Co., we feel quite sure, when they know it, will not feel disposed to treat the matter lightly.

DIPPING THREE SHEETS OF WAX AT A TIME.

WHEN Mr. S. J. Baldwin, of Bromley, England, a supply-dealer, was here at the Home of the Honey-bees on a visit, we naturally talked over many of the kinks of the trade. When going through our wax-room he suggested to us using a counterbalance for dipping-boards in making the wax sheets for foundation. Up to the time of his visit we had been using dipping-boards some 30 inches long, dipping the same endwise into a deep vat of wax, only one board at a time. Mr. Baldwin told us that he used two and three at a time. With the counterbalance, the plan is this:

A common small pulley is attached to the ceiling, just over the dipping-tank. Through this is passed a rope fastened to a sort of gripper that holds three boards at a time, and spaced about an inch apart. The other end of the rope is passed through another pulley, some four or five feet away, attached to a counterbalance, or weight, that is just equal to the weight of the three boards and gripper. The reader will readily catch the idea. Gravity is completely overcome, and all the operator has to do is to plunge three boards, without weight, as it were, simultaneously into a deep tank of wax. We immediately put the scheme into practice, and find that we can now dip six sheets of wax in nearly the same time that we could formerly dip two, and with considerably less labor. We have been using two of these arrangements for a couple of months, and the women-folks do considerable scolding if they

have to dip a few sheets of odd size without the counterbalance.

This idea will be found to be exceedingly valuable to makers of foundation; and while it may not be practical for the mass of our readers, it may be interesting to know of the latest mode of dipping.

UTAH HONEY SAID TO BE ADULTERATED WITH SUGAR SYRUP.

THE following is a clipping that appeared in the Cleveland papers, and we give place to it, slangy heading and all.

DON'T MONKEY WITH THE LITTLE BUSY BEE'S GRUB.

Whosoever supplies the busy little bees with sugar or syrup, and sells the honey made therefrom by the bees, violates the law, according to a decision made by Prof. Smith, of the Case School of Applied Science. On Saturday last, Justice E. H. Bohm fined Frank Jankovski, a wholesale dealer in the product made exclusively by the bees, \$25 and costs.

Jankovski's place of business is located on Frances St. Prof. Smith, who analyzed the honey, testified that it contained 15 per cent of sugar and syrup. The honey originally came from Utah, and was sold to Jankovski by a Chicago firm.

Attorney W. A. Babcock, for the defendant, will appeal to the common-pleas court, claiming that Jankovski was ignorant of the fact that the honey was impure. Prof. Smith's statement has caused considerable comment, and a fine point for the legal talent to decide is now on the tapis. Mr. Smith says that, when sugar is fed to bees, their owner expects that honey will be made therefrom, and therefore is as guilty of violating the law as though the sugar were mixed in with a spoon.

Mr. Jankovski has sent us a sample of this honey, stating that it came from S. T. Fish & Co. The latter acknowledged sending Mr. Jankovski this honey, but they insist that it is absolutely pure honey from Utah. Samples have been submitted to us, and we unhesitatingly pronounce it pure, and just like the Utah honey that we have seen and tasted in Utah. See our editorial on page 103. Sweet-clover honey from Utah, when candied, is as white as lard. When not candied, the honey looks almost white, not unlike sugar syrup; and, indeed, in flavor it gives one a suggestion of it. We do not wonder, therefore, that consumers think that this honey is sugared.

We know nothing against Mr. Jankovski; but, on the contrary, judging only from the general candor of his letters, we believe him to be thoroughly honest and reliable. We feel very sure, from our dealings with S. T. Fish & Co., that they are entirely straight. They have been making an active fight against adulteration of all sorts, and are building up a good reputation on strictly pure goods.

Now, it looks to us as if Prof. Smith had jumped a little at conclusions. Observing that the honey candied as white as lard, and when uncandied looked white, and tasted a little like sugar syrup, he possibly wanted his chemical analysis to show sugar. Again, it is well to observe that he found only 15 per cent of sugar syrup. If any one is mean enough to adulterate at all, he would not stop at 15 per cent, but put in enough to make the operation pay. The

result of the analysis is an absurdity on the face of it.

We can not now place our fingers upon the authority; but, if we are correct, pure bees' honey may show anywhere from 3 to 12 per cent of the same chemical qualities found in cane syrup; that is, it is there from the flowers. In the second place, we know the best chemists, while they are perfectly sure they can detect any quantity of glucose in honey, are not so sure regarding small per cents of sugar syrup. Especially is this true when it is fed to bees or passed through the process of "inversion," as it is technically called.

Finally, it looks as if Prof. Smith has been reading some of the sugar-honey articles that appeared a year or so ago in the bee-journals. He is probably aware of the fact that some beekeepers consider the practice of feeding bees sugar, to produce sugar honey, perfectly legitimate and proper. The knowledge of this leads him to suspect that the producer of the honey above mentioned has been feeding his bees sugar syrup. We do not believe, from the general characteristics of the Utah (or sweet-clover) honey that any sugar syrup found its way into the honey, either through the bees or otherwise.

S. T. Fish & Co. feel that their good name is at stake, and, we understand, expect to push the thing a little further. We should at all events like to see analysis of this honey from Prof. H. W. Wiley, the Chief Chemist at Washington.

CHARGING OLD SUBSCRIBERS MORE FOR THEIR JOURNALS THAN WE DO NEW ONES.

ALMOST every season, especially after we make some special effort to get GLEANINGS introduced into new localities or new homes, we are accused of making our old friends pay more for their journal than we do entire strangers. In fact, one friend writes as follows:

It is unjust to charge a ten-year subscriber more for your paper than one just commencing.

Bates, Ill., Jan. 20.

J. R. MORRISON.

Now, from one point of view there is some justice in the above charge; but I do think, taking all things into consideration, that it is not quite so bad, after all. It is true, we have many old and tried friends who take our journal right straight along, year after year. We recognize them as the main props in keeping up our circulation—we always feel under obligation to them; and the very first announcement on the inside of the first cover grants special privileges to these main props in this way: We send GLEANINGS two years for \$1.80; three years for \$2.40; five for \$3.75. You see this makes the price only 75 cents to the veterans. Now, after having done this we frequently say to these same veterans, "If you will show the journal to your neighbors we will pay you liberally." Just one illustration: The

Gault perpetual raspberry, that promises to make such a sensation in small fruits next season, worth \$1.00 each, or \$10.00 per dozen, is offered to anybody who will give two new names at a dollar each. If old subscriptions are sent in, however, instead of new ones, we require *four* names instead of two. The difference is this: You probably know which of your neighbors take GLEANINGS. Suppose you go to them in December, and say, "Neighbor H., you are probably going to take GLEANINGS next year?" He assents, and then you say, "Let me send and get it for you, for I am making up a club to get a raspberry-plant." In doing this you do not extend our circulation a particle, for he was going to take the journal any way; but the man who solicits and obtains a *new* subscription frequently gets it into a new neighborhood, and the new man in turn gets it into *other* new neighborhoods. Almost every periodical published makes a special effort to extend its circulation in this way—that is, if the publisher is a live man. Another thing, the special low rates offered for new names are for the first year only. The man who has taken it once, if he wants it continued is thereafter a renewal and not a new name. Once more: If the observation made by friend M. is just and fair, we must have one price on our journal for everybody. The man who sends in a list of ten names, and the man who sends for GLEANINGS for ten years ahead, must pay just the same as he who takes only a single copy for a single year. If the editorial heads are not level on the above question, we should be glad to be righted. We can not, however, afford to give space to a discussion in regard to the matter without any new points being brought out.

A. I. R.

SIMPLE METHODS OF DETECTING GLUCOSE ADULTERATIONS.

Bro. York, replying to our editorial on page 63, wherein we criticised Veteran for not making his glucose test thorough, calls our attention to the fact that the directions that Veteran went by differed from those that we had; that Veteran's test was thorough, according to *his* directions. And now Bro. York asks how we may be able to detect glucose by the taste, and asks for a simple formula for detecting adulterations in honey. Why, bless you, Bro. York, we thought we did; but as we did not, perhaps, make ourselves clearly understood, we will explain more fully.

THE TASTE TEST FOR GLUCOSE.

Such glucose as is used in commerce has a disagreeable, rank, metallic taste, very pronounced; and one who has tasted such pure glucose can easily recognize the stuff when mixed in honey; that is, providing the proportions are not less than 25 per cent. This can be done as easily as the good housewife can tell whether salt has been put into an oyster-stew.

In fact, we believe *we* could tell quicker, ourselves, glucose in honey than salt in the stew. It is impossible for us, of course, to set forth in language just how the glucose tastes in honey, so we have sent to Bro. York a sample of the finest glucose we could buy on the market—that is, such glucose as is used commercially for adulterating. It is called "Crystal A." the very best. Now, if Bro. York will take a liberal dose of this glucose, and, later on, get his better half, or somebody else, to introduce, "behind his back," proportions of $\frac{1}{4}$, $\frac{1}{8}$, and $\frac{1}{2}$ into variously numbered samples of honey, we think that, when they are placed before him, together with samples of pure honey, he will be able to separate "the sheep from the goats."

We ought to say, in this connection, that there is glucose from which the rank, disagreeable, metallic taste has been almost entirely eliminated, and the use of which in honey might not be detected. We have had small samples here; but we can not get it for less than 5 cts., and this would be more expensive than sugar syrup. If this is true we have, therefore, practically nothing to fear from glucose of this quality. It is only the rank disagreeable stuff costing about $2\frac{1}{2}$ cts., which we have sent to Bro. York, that is used commercially. As to Veteran's experiment with the use of alcohol, we have to acknowledge that his formula was not the same to which we referred. In looking over the test which he followed, we find it to be a sort of corruption, evidently taken from the alcohol test which we took from the *Bienen-Vater*. That test reads as follows:

Take a tablespoonful of honey to be tested; pour it into a small bottle, and then add three spoonfuls of pure spirit, and shake the whole together thoroughly. In about a quarter of an hour there will form in the bottle a cloudy, whitish sediment; and from this one may be sure the honey is adulterated.

This, if carefully followed, will, we believe, give quite satisfactory results. We did not mean to say, on page 63, that *all* forms of adulteration can be detected; but we desired to convey the idea that it was our belief that *ordinary* glucose mixtures of honey could be recognized by the ordinary bee-keeper. The principal and only adulterant of honey is probably glucose. Sugar syrup is used rarely if ever.

In conclusion we would say that the only way to detect glucose (that is, the commercial article) in honey *by the taste* is to get a small sample of the stuff and learn how it tastes. If any of our readers want to make the "taste test," as above given, we will send a sample of the "pure stuff" for 10 cts., to pay postage and packing.

P. S.—Since writing the above we have learned that a number of glucosed samples of honey, together with other samples of pure honey, were placed before Prof. Cook at the Los Angeles convention, recently held in California. The Professor recognized each one by the taste.



Give, and it shall be given unto you; good measure, pressed down, and shaken together, and running over, shall men give into your bosom.—LUKE 6:38.

A PRIVATE LETTER TO A. I. ROOT.

Friend Root:—I notice in your Home talk for Jan. 15, as a remedy for the hard times, you exhort the people (at least the poorer class) to economize more—that is, to work harder and live closer. Now, our politicians and most of our leading papers say that the low prices now prevailing are due to overproduction. Now, if that is the case, to work harder would be to produce more; and to live closer would be to consume less. Do you not see that that policy would only augment the trouble? Would it not be more reasonable, if overproduction were the cause of hard times, for the people to work less and consume more? But, again, is there such a thing as overproduction? When hundreds and thousands of people all over our land are famishing for the very necessities of life, is it not a case of underconsumption? S. FARRINGTON.

Corunna, Ind., Jan. 22.

I may add, there is more to the above kind letter, but we have hardly space to go into it here. I think I know pretty much all that our friend mentions, and I took the matter into consideration when I gave the advice that we should make our expenses come within our income. I would do this *first*, and then I would undertake to right some of the great wrongs that are afflicting our country. The man who is in debt is in poor shape to remedy great evils. Besides, if he should undertake to repudiate his debts he would, in most cases, wrong his neighbor who may be suffering in exactly the same way he himself is. The remedy I have been preaching and practicing for having so many unemployed people in our land, is to set them at work raising or producing the things they consume. In this way there are no middlemen; there are no railroads to defraud the poor man of his earnings; there are no banks to rob him. Yes, I would not only produce from the soil the food we need, but I think I would go back to producing the clothes we are to wear. Our forefathers got along very comfortably, raised large families of good men and women, and it can be done again. I despise the man, as much as any of you, who pays five or ten dollars for his dinner, or, if you choose, even one dollar for his dinner right along, when people are almost starving for the very cheapest and coarsest food. When this same man puts on airs, and thinks he is too good to touch people who labor for a living, it awakens feelings of disgust in my heart. Yet I would not advocate violence or anarchy. I would simply *starve him out*. I would be both *producer and consumer* of the things I needed, to avoid paying him interest or rent, or the tremendous profits such men sometimes receive, taken from the poor man's earnings. While I say this I recognize that God seems to have so ordained it that some men should furnish capital while others should furnish brains and muscle. I am not afraid that consuming *less* and working *more* will aggravate our troubles, providing more people can learn to set themselves at work without asking anybody, unless it be the great God above, to furnish that employment. I want to see more people working for God instead of for some human boss. I want to see more people working *with* God. I want to see them making use of God's sunshine, air, and rain, without paying any human being for the privilege of so doing. Our land is broad enough,

and the world is wide enough, so there need not be any suffering for want of food or clothing.

The present age needs educating in regard to this matter of finding employment. Humanity must not get into a fashion of thinking that somebody *else* is to find them a job. They must not drift into a way of sitting down helpless because nobody wants to hire them. Get at it, and be busy at something until somebody wants you. You know this is a subject on which I have talked and exhorted, over and over again. In fact, I have published two books with this special end in view. I do not know how I can better illustrate what I want to say than by quoting from my own life; but please do not think, dear friends, that I want to boast.

When I was a very small boy my mother says I always found something to interest me, and something to enjoy. I never came to her saying, "Mother, please tell me what I shall do." I can remember vividly when I began to notice the multitude of wonderful things there are in this world. When quite a child I became interested in seeing the ants work building their hills; and whenever I had leisure I enjoyed myself hugely in studying their movements. The sight of the growing grass, the budding branches, and all these things, were an unceasing delight; and when I discovered it was my privilege to have a *hand* in the great machinery of life, it was a new delight. My first business in the way of earning money was in keeping poultry; and after I had got two "biddies" of my own to care for and study—from that time forward, I think I may say, I have never been out of employment. I began studying the wants of my two hens, much as the experiment stations carry on their work nowadays. I quickly began to note the effect that certain kinds of food had in regard to the matter of the production of eggs. I walked eight miles to the bookstore to get a book on poultry I saw advertised; and I sat down so often on the way to study that wonderful book that I came near not getting home that same day. About this time Moore's *Rural New-Yorker* was started. It was taken by my grandfather, who lived two miles and a half from our home. They did not want to lend the paper, so I managed to be on hand as soon as it came from the postoffice. Other papers were scanned for their articles on poultry. I learned to pound up bones with a hammer, and drew butternuts in a little wagon, said butternuts being pounded up much as we did the bones for the biddies. Then the *Rural New-Yorker* told me how to make use of the poultry *manure*, and that opened up agriculture. Busy! Why, not only was I busy, and having fun too, every minute of my boyish life, but I presume I could have set other people at work too, providing I could have found people to think *while* they worked. Let me illustrate:

I do not like to find fault with these good friends near me here; but I want to tell you what an unexplored region there is before the people of the United States.

Plumbing and gas-fitting are at present quite a department in our establishment. There are water-pipes, steam-pipes, air-pipes, and pipes for almost every sort of purpose, running in almost every direction. These pipes save us steps, and, of course, there must be attendant valves, elbows, T's, unions, reducers, and all the attendant fixtures. The piping and the sewerage have, in some way, fallen under my supervision. I have begun to think I might be called "hydraulic engineer" of the establishment. Well, you do not know how I have wanted trusty helpers, or a trusty helper in this work. In putting in my storage battery

for heat that warms our home, I became acquainted with a boy who had served a sort of apprenticeship in plumbing. He helped me and I helped him, and we got along nicely together. In skill and muscle he is all I could ask; but in the way of brains and this matter of thinking continually what he is doing, he does not quite come up to my standard of perfection. By the way, *no one* ever did, and I do not know that any one ever will, while I live at least. We see illustrations of what thinking men may do in this way, but we realize there is an unexplored region in that line. Nobody knows what humanity may bring forth yet in the way of a *thinker*. Edison started out and shot across the horizon like a bright meteor. Who can contemplate the strides he has made, and the blessings he has brought to the world, without wonder and surprise? Let us now go back to that boy friend of mine.

One day it became necessary to shut the valve that comes from the windmill—in fact, to cut off the whole water-supply of our establishment—for about five or ten minutes. I objected, and asked if there were not some other way. They said there was another way but it would take a good deal longer. If I would consent to having the water cut off for just *five minutes* they would have it all fixed. Well, I planned to stand right there during the five minutes and see that the big valve was promptly opened just the minute the connection was made, for we had had some sad experience in having work stopped, such as the horses led off to the creek for water, somebody tinkering with hydrants, spoiling them by twisting them too far, or the wrong way, simply because the accustomed water did not come. I made all the arrangements, and saw the big valve closed; but something else of importance called me away. Before I left I said to the boy, "Now, Harold, you be very sure you open that valve just as soon as that connection is made." He declared he would; and the man who was helping him said too that it would be opened inside of three minutes. I went away, and supposed every thing went smoothly, until, some time in the afternoon of the same day, the foreman of the wax-room wanted to know how long the hands had got to hunt up some other work because the *water was cut off*. I think likely I scolded some. I went for the boy, and asked him if it were possible he forgot to open that valve after all the fuss I had made about it. He hung his head, and admitted that it was not opened at all after they got done. When I asked for an explanation he did not say any thing. As he was but a boy, and such things are boylike, I let it go. Now, if it were only *boys* who make mistakes of this kind I would not mind. This kind of work is all through the laboring classes. Of course, the circumstances are not always so aggravating.

When carrying the exhaust steam over to the house, after I got the apparatus all rigged, the arrangement did not work as I expected it to. The pipes were warmed somewhat. It is true; but for nearly a week I fussed and bothered to see why the exhaust steam did not come through the tiles as it ought to. The engineer grumbled some because the steam was making a back pressure on his engine; and the boys rather thought—at least I rather fear they did—that some of father's experiments for warming the house without cost might result in a pretty *big cost*. After a deal of study I located the trouble. The big iron pipe at the end of the line of tile, was stopped up in some way. We dug it out and held it up to the light, but—*there was no hole through it!* The men, in raising it up to its place, had let it stand for a second in the soft muddy ground. The lower

end was plugged up with a couple of inches of yellow clay, and in this condition the apparatus was expected to work.

Again, the drip-pipe near the engine, that was to carry off the accumulation of water from the condensation of exhaust steam, did not work—at least, the water dropped only very slowly. The men thought it was all right, but I declared it should run a quarter-inch stream continually. The drip-pipe was pulled up; and the last piece, not more than six inches long, was found to be plugged up near where it entered the elbow. I spoke to the boy—the same one I have mentioned: "Harold, when you are putting up piping do you not always look through each piece, or blow through it, to see that it is clear?" He said he did sometimes, and sometimes he didn't. I added: "But when you have a little pipe, only six inches long, you surely hold it up to your eye to see whether there is a hole through it, do you not?" He admitted he did not. Now, I wonder how many plumbers or gas-fitters there are in our country who are in the habit of making it their business to see that there is really a *hole* clear through the pipes they are putting up. Cutting off the drip-water had necessitated the exhaust steam moving all this accumulation of water; several hundred feet *up hill*.

Once more: One of the hearing-tubes of our phonograph refused to talk. I do not know how much expense it made us, nor how long the boys worked at it to find the trouble; but after some of the boys—I think it was John—got sufficiently in earnest about it, he held it up to the window and looked through it. What do you think? A little spider had spun a web clear across the tube, from one side to another. I suppose that, as he progressed with his delicate silky fibers, the voice from the machine began to be more and more indistinct. When he had got his web completed we could not hear at all. All these expensive troubles are the result of lacking thought, or need of brains, if you choose. They are all simply a blunder; and if the workmen who had them in charge had been constantly thinking and studying his business, and having his whole mind concentrated on his work, in his anxiety to have every part perform its office, these things would not have happened. Yes, it *would* be more than human to demand that one should never make mistakes.

Our radiators at the house were all working beautifully, when all at once one of them began to leak a little. I told Mrs. Root that the heat and oxidation would soon close up so small a leak. But it didn't. Finally one corner of the carpet was being so constantly soaked by this slow dripping it would ruin it if not stopped. The leak was close to an elbow, and there seemed to be no remedy except to draw off the water, take down the pipe, and screw it up tighter. Mrs. Root had thought several times before, that she had had all the fussing with tongs and wrenches, and men with greasy fingers, that she could stand for one winter. I greatly disliked the idea myself of tearing up our work when the pipes were finished and bronzed, and every thing, except that one leak, so clean and perfect. Just before going to bed one night I soliloquized thus: "I turned up that joint myself, and I am sure it is tight enough so it ought not to leak. Is it not possible that a little brains will obviate the necessity of pulling things to pieces?" I told Mrs. Root what I was thinking of, and asked her to bring a certain light hammer she always keeps in a particular spot in the pantry. Then I got the best lamp with a large clear blaze, with a good shade, so as to concentrate the light. I found that, by lying flat, on my back, and pushing my

face close to the radiator, I could get a glimpse of the spot where the water came from. With a clean cloth I wiped the water all off and watched its reappearance. In a minute I was ready to shout "Eureka!" The leak did not come from the joint at all. It came from a minute sandhole in the malleable iron in the elbow. There was very little room to use the hammer in such a place; but after twisting myself in some more queer shapes I managed to get a pretty fair blow with the peen of the hammer. Two or three strokes did the business, and I just felt happy when I saw the last drop of water curl up in a little wreath of steam, and the pipe was left dry, clean, and hot. Over and over again I have seen mechanics go to work and spend hours of time and considerable money when almost a single tap with a light hammer in just the right spot would have been a perfect cure for the thing they were trying to remedy. All that was needed was skill and brains to wield a little hammer. On one occasion, expensive men were employed, one after the other, to remedy a peculiar trouble with the pump. They finished the job, so they said, and they got their pay. We are sure of that. But they went away leaving the pump no better than when they came there. Finally a mere boy studied out where the difficulty was, and fixed it himself.

Now, people are out of work because it costs so much to have any thing fixed. People can not stand it. They have been humbugged by paying to have things done only to find them no better, but sometimes worse. You may think I am complaining of humanity. I do not mean to. I make stupid blunders myself, and a great many of them. But I am *learning* every day of my life. If I were out of work I would commence educating myself to repair domestic machinery. When I first started in business as a mechanic I did this very thing. My business was watch-repairing; but if anybody wanted me to mend a coffee-mill I took it thankfully and cheerfully; and I made sure the coffee-mill did good work by actual test; and then I made sure again that my price for repairing was not more than the mill was worth. To do this I sometimes worked for one-fourth of regular wages. But I was determined to build up a business, no matter what it cost, and most of you know how I have succeeded.

The market-wagon came around a few minutes ago, with the back springs broken down. Three pieces of steel were snapped. As the roads were a little rough, it is not very surprising; but I have learned by experience, however, that there is almost always a very plain reason; and, nine times out of ten, if we investigate we shall find the breakdown resulted from carelessness or forgetfulness. After giving directions to the blacksmith about an immediate repair I took hold of the hind wheel near the break, gave it a shake, and saw that it slipped on the steel spindle nearly an inch.

"Why," said the blacksmith, "you have lost out the washers I put in there about six months ago. Don't you know I told you that whoever greased the wagon must be very careful that the washers should not drop out and be left out when the wagon was greased?" We always grease the wagon while it stands in the middle of the floor of the room where it is kept over night and loaded up. If the washer fell out it dropped on the floor. The shake of the load, in consequence of these washers being left out, was probably what caused the break of the springs. The driver said he knew it had been out a long time. The world is clamoring for men who think—who are alive to the interests and rights of other men. People come to me day after day, with pitiful faces, saying they

have nothing in the world to do, and do not know where they can find employment. Now, may be you think I am rough and severe; but I can hardly believe there is a man, woman, or child in our land who has absolutely *nothing* to do if such persons were dead in earnest in *wanting* something to do. Even if we are out of work, it costs us something to live. Food, clothing, and fuel cost money. There are few people, especially poor people, who take care of their clothing as they might do, and who take sufficient pains in keeping it in repair; and the same with shoes. My boots are promptly and properly cared for, and they will last two years and do me good service; but a great many do not care for their boots or shoes at all. If they clean them they rarely or never oil them. The simple matter of neglecting to oil your boots and shoes will make them wear out in six months or less, where they might otherwise last two or three times as long—if also repaired promptly and judiciously.

During the winter time we must pay out more or less for fuel. The way fuel is commonly used, half or three-fourths goes up the chimney. Using the intelligence that God has given, you will cut down the bill for fuel a half or possibly more. See to it that the wind does not blow under your house and up through the cracks of the floor nor in around the windows. I believe in ventilation, but you can have the best ventilation in the world and save your fuel besides.

When I was quite a small boy I became interested in this matter of protection from the weather. I wanted to work with tools; but there was a family of seven children, so my tools and my work would be rather in the way in the house. I made a little shop of my own, outdoors; and when the weather was severe I warmed it with a brick oven of my own manufacture. After I had had experience in having my eyes filled with smoke, I learned my first lessons in conducting smoke. The cellar to your dwelling can be made very comfortable, and a neat work-room during the winter time.

For ten or twelve years a great part of the cellar under our home has been so untidy—I don't like the word "untidy" after all, for Mrs. Root has persisted in sweeping and scrubbing it up in spite of all difficulties; but since we put in the new heating-apparatus we have had the walls whitewashed and the floors cemented, and now it is such a pretty, light, warm room that Huber prefers it for a playroom, and the girls are going down there to study their lessons. The place has been made so pleasant that I feel happy every time I go down there to take my accustomed nap just before dinner. With some hard work and a little expense, almost every home may have a cellar that will do quite well for a workshop in winter.

When Orange Judd was a boy in college he ran short of funds. He too had learned to "fix things" in his childhood. Well, he wanted money, and he wanted the most he could make in a short space of time. He went off across the country fixing clocks. Would people employ an unknown adventurer? He told them he was coming back a month later, and he did not want any pay until they had tested the clock thoroughly. Of course, there was no trouble in getting work in that way; and there will be no trouble in getting work *now*. If your determination is to give full value for the money you will receive, and if you are prepared to be *responsible* for your work, everybody will want you.

A good deal has been said about cutting off the profits of the middlemen. I am not quarreling with the middlemen. I do not believe they are cheats. But there is a certain kind of

middlemen that we can cut off as well as not. We can withhold our patronage from the saloon-keeper, for one thing, and in the same way we can withhold our patronage from all who are speculating out of the earnings of poor people. Our agricultural papers have had much to say in regard to farmers selling produce directly to consumers. Find somebody who needs the stuff you raise, and then make a short cut by delivering your product directly to him. You understand, of course, my remarks are directed principally to those who are suffering because they have nothing to do, or because the work they are doing does not pay sufficiently. It may be that *muscle* is plentiful in our land; but of brains there never was an oversupply. There is not and never was an oversupply of earnest, honest thinking men and women—the kind of people who think for others; who love their neighbors; people who always make it a business to take a stone out of the highway—a stone that may injure a wagon, and gall the shoulders of the poor hard-working horses. We want men and women who, no matter what they are working at, would never think of doing such a thing as to put in a piece of piping without first looking through it to see if there were a hole through it. We are not all going to be plumbers, but we are, all of us, laboring for somebody. The consequence of our blundering often costs dollars. A poor woman once came to me begging for employment. I set her at work. She was trusted one day to mail some garden seeds. A man wanted some Wakefield cabbage seed to plant right away. It is true, he wanted only a five-cent paper; but this new clerk sent him an empty printed wrapper, without any seeds in it at all. She had not love enough in her heart for her fellow-men to simply pinch the empty envelope while it was in her fingers, to see whether there were any seeds in it or not. She said it was only a mistake. Some of the others took her part, and thought I need not make so much fuss because of a simple thing like that—picking up an empty seed-bag instead of one that contained seeds. Now, I am trying hard to make myself understood. The idea is this: He who commences any sort of business, or who commences to earn a living, should have, first and foremost, at the bottom of his heart a deep and sincere anxiety to *do good* in the world—to be helpful; and he should be so anxious for the welfare of his fellow-men that, whenever he undertakes to serve them in any capacity whatever, he should look out for their interests. I do not know exactly the circumstances of your own life, so I can not map out in detail just what would fit your case; but a love for humanity—a love for Christ Jesus, and a sincere desire to do right by your fellow-men, recognizing that the eye of the great God above is constantly over you, will, I am sure, bring you plenty to do, and at reasonably good pay. "Give, and it shall be given unto you," the Bible tells us. I do not understand by this that you are to give money or bread and butter to tramps; in fact, I do not think it means that at all; but it does mean that, in your daily work, you should give good and liberal measure to your neighbors, to your men, to your employer, to your hired man, to everybody with whom you have to do. Be liberal with them; look out for their interests, study their comforts and their needs; plan so as to avoid accidents, hitches in business, delays and disappointment, and they will in like manner plan for you; and the great God above will, in his loving kindness, plan for, look after, and protect you both.



ONIONS.

I do not know but some of the friends will think this is an onion number, even though in one respect the onion business is not very encouraging. I hear that, in some localities, very fair onions are offered at from 75 cts. to \$1.50 a barrel. Never mind. There is money in onions yet. The seed-catalogues are quoting potato onions at from \$2.00 to \$2.50 a peck. What do you think of that—from \$3.00 to \$10.00 a bushel, to say nothing about a barrel? and onion-sets are about the same price as potato onions. By the way, what is the reason nice onion-sets are quoted year after year at from \$4.00 to \$6.00 a bushel or more? I believe they can be grown almost anywhere, and children very often grow the very finest. And, by the way, what has become of the old-fashioned top onion-sets? When I was a boy I made quite a little money growing onion-sets. My mother showed me how. We just planted big onions, and the sets grew on top of the stalks, like the Egyptian onions, and all these sets made nice large solid onions, and onions that were good keepers. Furthermore, after all the sets had been gathered, the onions could be taken up and put into the cellar, and the next year they would bear another crop of sets, and so on.

We never had a bit of trouble in selling our product. The nearest grocery would take the whole lot at a price that paid big. A good many times the grocers would be bidding against each other in order to get them, especially if they were nice and clean. Who will tell me what these onions are called? I see something mentioned in one of the catalogues, but they do not give any name for the onion. They call them top-sets, or buttons, and say they will produce large onions *quicker* than any other kind of onion seed. It strikes me I should rather raise them than to raise the sets that grow in the ground. Another thing, these top-sets were much more solid, and never sprouted in keeping over winter, as the sets that grow in the ground do. They were always marketable, and were not constantly deteriorating.

Oh, yes! I did find one Chicago house that offered onion-sets for \$3.50 a bushel. I sent for samples, but they had not even been put through a fanning-mill to blow out the chaff. The onions were soft and wilted also. We have growing in our greenhouses, chives, multipliers, potato onions, and shallots. By the way, I am greatly interested in this shallot business. They are the firmest, handiest little onion you ever saw, and they keep splendidly, so I am told. Read the following:

SPRING SHALLOTS.

A. I. Root.—At your request I will describe what I have always known as spring shallots. There are two varieties, red and white. The white are the best in every respect. They grow larger, and are sweeter. They do multiply. We put them out in the spring as early as the ground will do to work; put a single one in a place eight or ten inches apart, and there will be a dozen or more come from the one. When they get five or six inches high, thin out for bunch onions. You can pull out all but two or three, and they will send up seed-stalks and make seed which may be sown as other onions, and they will make beautiful little sets, which, in turn, will multiply. Their principal value is for bunch onions, on account of earliness. I never raised any except for family use, but

think they are almost invaluable in a large family. The red are the same in every respect, but do not grow as large as the white.

Shallots are very hardy. Pile them up in an out-building on the ground, and throw any coarse litter over them, and they will keep till spring perfectly. I suppose they would do well in the greenhouse through the winter.

Rail, Mo., Jan. 8.

N. A. E. ELLIS.

From the above it would seem that these shallots bear top-sets like our old-fashioned onions. But this statement contradicts what we said in GLEANINGS—see page 862, last year. The Cleveland Nursery Co., Rio Vista, O., told us they do not run to top-sets. Well, here is something more in regard to chives, shallots, multipliers, etc. The letter looks as though it ought to be authority in regard to the matter:

Friend Root:—The shallot, or eschalot (*Allium Ascalonicum*), is a native of Palestine. It was first introduced into England in 1548. It is quite extensively cultivated, and used in the same manner as the onion. It can be increased only by division. In this latitude the bulbs should be planted during the month of October, in rows about 18 inches apart, and 6 to 8 inches apart in the rows. They require rich soil and thorough cultivation to secure the best development of the bulbs. With Southern gardeners, shallots are one of the earliest and most profitable crops, their shipping season being from the first of December until March.

Chives (*Allium Schoenoprasum*) is a native of Siberia. It is the smallest of the onion family, and one of the finest-flavored, of very easy culture, propagated by division.

Garlic (*Allium sativum*) belongs to the same genus as the onion and leek. It is a perennial, and grows wild in the southern parts of Europe. It is more esteemed as a medicine than as an article of food. The plant, especially the root, has a pungent taste, and the odor, which is very offensive, is far more penetrating and diffusive than that of the onion. It is said that, when garlic is applied externally, the smell can be observed in the breath and perspiration.

There are also the common field garlic (*Allium vineale*), supposed to have been brought to this country from Wales, and *Allium Canadense*, or wild garlic, which is indigenous, and commonly found in moist meadows. The two last kinds are quite a nuisance in some localities.

S. W. PIKE.

St. Charles, Ill., Nov. 24, 1893.

Now, then, it is bad enough to have onion-sets, both top and bottom, quoted in all our seed-catalogues, year after year, at from \$5.00 to \$10.00 a bushel, let alone having shallots, multipliers, and potato onions, quoted at the same price. Why, I wonder what these catalogue men are thinking about. Have they got the idea that the world in general—I mean the gardening world—are so lazy that, instead of raising their own onion-sets, or, rather, instead of saving some over for seed, the great gardening world is going to buy of them, and pay them \$2.00 a peck? It is positively ridiculous. If the readers of GLEANINGS alone can not fill this "long-felt want," and bring down the price of these garden commodities, then I am ashamed of them—that is all.

In order to give you something of an idea of how it is to be done, I am going to copy quite considerably from an article that appeared in that excellent home paper, *The Country Gentleman*, about a year ago. It gives us a glimpse of a place in York State where they raise potato onions by the carload; and out there they are glad to get even \$2.00 a barrel instead of \$2.00 a peck. I do not know whether they have got any this year or not. By the way, if any of

the readers of GLEANINGS know where we can get potato onions, multipliers, and shallots, say for \$2.00 or \$3.00 a barrel, I wish they would write and tell GLEANINGS, and I will give them a free advertisement for a little time, and see if we can not find where we can buy these things at reasonable prices. Now, then, for the "how to do it."

ONION-GROWING IN NIAGARA COUNTY, NEW YORK.

[An address on Onion Culture, delivered before the New York State Agricultural Society Farmers' Institute, Middleport, N. Y., Jan. 5, 1893, by Wm. Bathrick.]

About thirty years ago Mr. Zadoc Stewart, living on the Ridge road three miles north of Middleport, bought and planted a half-bushel of English Multiplier onions, the first ever grown in our locality. He saved all his crop from year to year, and planted them all until he had what seed he desired, believing that onion-growing on a large scale would be a profitable business. Although he did not live to see the full development of his plans, the events of years have proved how well his predictions were founded. Twenty years ago Mr. H. H. Bickford, who bought the farm after the death of Mr. Stewart, barreled and shipped the first onions ever sent from Middleport in carloads. He shipped 567 barrels at \$4.12½ per barrel, which amounted to the handsome sum of \$2339 87. From that time forward others have engaged in the business, and their numbers and the quantity raised have steadily increased, until at present there are about thirty men who grow from 50 to 600 to 800 barrels each, besides many more who grow them in smaller quantities. There were shipped from Middleport and Gasport last season about 8000 barrels at an average price of \$1.87 per barrel, amounting to \$14,960; and Niagara County onions are quoted in the New York markets, and are shipped to Philadelphia, Boston, Chicago, Milwaukee, and many other of our large cities. It is estimated that there are at present stored in cellars for next year's planting, 5350 bushels of seed, and, so far as can be learned, every bushel of this seed, and all the onions of this locality ever sold—which is not less than 80,000 barrels, and amounting to not less than \$175,000—is the direct increase from the half-bushel of seed planted by Mr. Stewart thirty years ago. The territory devoted to this business at present is confined almost exclusively to land along the Ridge road, in the town of Hartland and western edge of Ridgeway—about 75 acres in all.

The questions which probably interest you most are—"How is it done?" and, "Does it pay?" I know of no better way to answer the first than to give my own experience, which covers a period of 12 years, and being, perhaps, about an average as to quantity grown, and also as to success, it would be a fair basis from which to draw conclusions. I have stored in my cellar at present 125 bushels of seed, which I shall commence trimming by cutting off the tops and roots, breaking apart the clusters and sorting into three sizes. As soon as the frost is out and the ground in condition to work, it will be fitted by harrowing and rolling until the soil is well packed and pulverized, and made fine to a depth of about 3 inches. Having been plowed in the fall, it will not be necessary to plow again in the spring, unless I should want to plow under manure, and that had best be done in the fall. I mark out the ground with a marker drawn by hand in straight rows 18 inches apart, and about 1 inch deep. I am now ready to plant, which is done by pressing the seed firmly in the row, roots downward, about 2½ or 3 inches apart. The seed is covered by throwing a light furrow on the rows with the plow attachment to the Planet Jr. hand-cultivator. The rows are then rolled down with a hand-roller. The different sizes of seed are planted by themselves. The large seed, which grow the clusters, ripen earlier than the smaller sizes, and, by being planted each size by itself, I can begin harvesting ten days earlier than though they were mixed. Besides, the universal rule that "the strong prey upon the weak" asserts itself with special force in the growth of the onion—in other words, plant a small, weak onion between two large ones, and the large ones will at once reach out and appropriate to their own private use all the available plant-food within reach, and grow and thrive, utterly regardless of the needs of their hungry little neighbor, who, for want of its share of plant-food, matures at best only into a little dwarf. I do not know whether the onion learned this trait of the human species or *vice versa*; they

both possess it, however, in about the same degree. As soon as the onions are up—which in favorable weather will be in about two weeks—the hand-cultivator is started, running twice in each row as close to the onions as possible. (A careful man soon becomes expert with the cultivator; last season a hoe was not used in my beds.) The onions should be cultivated as often as every ten days until the tops get so large there is no open space between the rows. If the cultivating is thoroughly done, I find it necessary to weed them only once, which is done just before the tops get too large to work among. I hire help enough to plant and weed them in as short a time as possible. It is essential to get them planted very early, so they will ripen in time for the early market. My onions (two acres) were all planted in a day and a half, and weeded in one day.

Harvesting is begun by pulling the onions, throwing 12 rows of onions into one winrow. Those large enough to barrel are now topped and left on the ground to dry or cure, which, if they are well ripened, will not take more than a day or two. They are then secured by rubbing together on the ground until they are clean and bright. Now they are ready to barrel, care being taken not to put them in barrel while they are damp. The seed or small onions are left lying on the ground until they are thoroughly cured and the sap or juice entirely dried out of the stem. They are then picked up, with the tops left on, in crates with slat bottoms, holding about three pecks each, and put in open sheds or some cool, airy place until hard freezing weather, when they are put in the cellars, and we are ready to figure our gain or loss on the crop.

This brings us to the question, "Does it pay?" in answer to which I have itemized statements from three growers engaged in this business, and who may be considered about an average in success, which I will here present, and which will enable you to judge for yourselves whether it pays. In these statements no account is taken of interest on land or value of barn manure used, but I will say it is about the same as though the land were prepared for a first-class yield of potatoes; neither is interest on capital invested in seed considered, as the seed grows along with crop, and generally increases each year more than 6 per cent, which would offset the 6-per-cent interest on the investment.

NO. 1—ONE AND A HALF ACRES.

Trimming 100 bush. seed	\$12 50
Preparing ground	3 00
Planting	10 00
Cultivating and weeding	27 50
Harvesting	26 00
Paid for 201 barrels at \$22	44 22
Marketing	12 50
Gathering seed	3 75
Raid for $\frac{1}{2}$ ton phosphate	12 50
Total expense	\$151 97
Sold 201 barrels onions at \$2.00	402 00
Balance after expense	\$250 03
Profit per acre	166 68

NO. 2—SEVEN ACRES.

Trimming seed	\$63 12
Preparing ground	25 00
Planting	62 53
Cultivating	32 00
Weeding	38 94
Harvesting	127 55
Phosphate	25 00
725 barrels at \$22	159 50
Total expense	\$ 537 64
Sold 725 barrels at \$2.00	1450 00
Balance after expense	\$ 912 36
Profit per acre	130 99

NO. 3—TWO ACRES.

Trimming seed	\$12 00
Preparing ground	10 00
Planting	19 43
Cultivating	12 50
Harvesting	8 89
Bought 331 barrels	28 52
Drawing to market	66 22
Gathering seed	9 50
Bought 1500 lbs. phosphate	6 25
Total expense	\$ 191 31
Sold 301 barrels onions at \$2.00	602 00
Balance after expense	\$ 410 69
Profit per acre	205 34 $\frac{1}{2}$

SUMMARY.

Total acres in cultivation, 10%.

Total expenses	\$ 876 92
Total sales	2454 00
Total balance after expense	\$1577 08
Profit per acre	150 19

The yield and prices given above being no higher than the average for the past ten years, these statements may safely be considered a fair answer to the question, "Does it pay?"

The soil best adapted to the growing of onions, in my judgment, is a sandy loam that holds moisture in continued hot, dry weather; if the soil gets too hot and dry, the onions are liable to burn. It must be free from surface water, or flooding in rainy weather, as a few hours' hot sun on onions covered with water will surely scald them and ruin the crop. I believe the ground should be plowed in the fall, and what manure is intended to be used should be then turned under, and, in the spring, work the ground on top, drilling what fertilizer is used with a grain-drill, and the soil rolled and harrowed until it is thoroughly pulverized and made very fine three inches deep. It is not a good plan to manure on top with coarse manure, as it hinders very much in planting and cultivating.

Onions may be raised on the same ground year after year, if the fertility of the soil is kept up by a liberal supply of barnyard manure and phosphate. I know a field upon which onions have been grown every year for more than 25 years, and last season's yield was a good average. But recently I have adopted a system which I think far better. Every two years I change my onion ground, plowing under a heavy growth of clover. Every tiller of the soil understands the benefits of a rotation of crops; also of plowing under clover, good results of which manifest themselves especially in onion culture. It not only fertilizes the soil, but it will hold moisture better, and rank clover is a great agent in freeing the land from weeds. I don't have half the trouble in keeping the crop clean from weeds the first season after plowing under the clover. After harvesting the crop next season, I intend sowing the field to wheat, or to barley in the spring following, and seeding to clover. I mow the first crop of clover, and plow under the second growth, which on land in a high state of fertility will be heavy.

If I were to give advice to any one thinking of starting in the business, I should say, buy but a few bushels of seed, begin in a small way, and let your experience and business grow along together. I have known failures by starting in on too large a scale. There are several things to learn before success is assured. When I see a man start out without any knowledge of the business, and buy a large amount of seed, I keep an eye on him, for the chances are that in about two years he will be disgusted with the business, and it is a first-rate place to go to buy seed cheap. I began with $2\frac{1}{2}$ bushels, and kept planting all I raised until I had enough, so that my first sale was 225 barrels. Had I started in by buying 100 or 200 bushels of seed, the chances are that I would have been out of the business long ago, and no one would have thought of asking me to read an article on "onion-growing" here to-day.

A person, to succeed, must have soil adapted to the growth of the onion, and a cool, dry place to winter his seed. The seed ought not to freeze, but slight freezing is better than too much heat. He must not expect to raise a profitable crop of onions and a heavy crop of weeds on the same ground at the same time. Weeds are the eternal enemy of the onion-grower, and he should be constantly on the war-path with every implement of destruction and death he can invent. Weeds grow in wet and dry weather. They work nights and Sundays and Fourth of July; they are especially active and put in their "best ticks" while we are gone a-fishing or to the circus or horse-race, and what advantage they gain from you in one day it will take three to get back. Every weed should be plowed under immediately after the crop is harvested, and the ground cultivated as often as they make their appearance.

If you are growing onions to any considerable extent, do not be afraid to hire help to plant and weed them as quickly as possible. It will be cheaper and more satisfactory in the end. I often see as many as twenty men and boys in the field at a time during planting and weeding. When onions are ready to weed, be ready to do it with all the good help you can get. Weeds grow very fast at this time of year, and you will have lots of other work to do; but the onions *must* be weeded; and if you try to do it with your ordinary force of help you will probably be running a mowing-machine of some kind over the field before you can find what you did with \$400 or \$500 worth of seed in planting time. Boys can plant and weed onions; but in my opinion good reliable men, paid good wages, are the cheapest and most satisfactory help a farmer can get.

The question may be asked: "How much seed does it take to plant an acre?" To this I would reply, it depends entirely on the size of the seed. I have seen seed so small that it could be done with 15 bushels; and I have planted it so large that it would require over 300. I should think the medium would be, perhaps, about 75 bushels per acre.

While I have known many failures in men trying to raise onions, I know of no branch of farming that will pay better if the soil and all the conditions are favorable, and a fair degree of industry, economy, and intelligence is applied.

MONEY IN ONIONS.

Editor Gleanings:—I have noticed with much interest your efforts to collect information in regard to profitable onion culture. This is a subject in which I have long been interested, having been experimenting continuously for twenty years. I am still learning; but being more familiar with the road which leads to success and profit than some of your readers, I will put up a few finger-boards which, if followed, will keep even a novice from going astray:

First and most important is the strain of seed used: for if the seed is not right it matters not what kind of treatment follows; failure is certain. A good crop can not be grown from inferior seed.

Second, get them to growing just as early in season as the weather will permit. No frosts are liable to occur which will injure them after the weather is warm enough to start them. Every plant has its season, and it is hard to make them grow successfully out of season unless placed under glass where the climate can readily be changed and controlled. This is noticeable in the case of our various garden-weeds. They come along in crops in regular succession, as the soil and climate become adapted to their requirements; and it will be found about as difficult to make an onion-plant thrive in July, August, and September, as it will to make pursley grow in April. Onions will not develop late in season after the weather becomes hot and soil dry. With exactly the same seed, soil, and care, I have known a delay of two weeks in planting to cause almost a total failure in the crop, while the first planted was a grand success. I consider this fact one of the chief causes of success by the "New Onion Culture" method of sowing the seed under glass and transplanting the plants, although special attention was not called to the great importance of getting them started early, by the author of that system, that I remember. If the plants are set in the open ground as early as the soil can be worked they are given a start which enables them to form the bulbs in season, while the climate and soil are congenial to their fullest development. In my opinion, nothing is gained by this system if you wait until late in season before sowing your seed and transplanting your plants.

Third, if you have been fortunate in securing a correct strain of seed, and have started them in season, see that you keep the surface of the soil continually broken or stirred, never allowing it to remain crusted over, because the plants will not make any headway while the ground is in this condition, and in consequence you are losing valuable time which can not be made up, for, as above shown, one day now is worth a week of time later on.

Fourth, keep the plot clean of weeds. Weeds are natural enemies to your onion-plants. They are thieves and robbers. They send their longer roots down and steal away the moisture which is necessary to the development of the onion. If very weedy, although they have an early start they are but little the better for it, as the weeds make the bed as hard and dry and uncongenial as it would be a month later, on account of the change in season.

Fifth, in cultivating and hoeing, never throw the soil against the bulbs, but always away from them. The large handsome bulbs always grow on the ground, and not in it.

Sixth, never use stable manure or hen manure on the onion-plot just before putting out the crop. If you do, the weed seeds you sow with it will cause you more trouble and expense than the manuring will benefit you. Better take ground which was heavily manured the previous season for some other crop, and then depend upon commercial manures for starting the onions. Sow these special fertilizers broadcast, and harrow them in. You can then make a heavy application without danger of injuring onion seeds or young sprouts.

If you think the soil lacks fertility after the crop is well started and past the stage of finger-weeding, a compost of hen manure may be sown broadcast over the surface, with excellent results. The rains will then wash it in, and the wheel-hoes will destroy the resulting weeds as fast as they germinate.

Now a word about varieties. For transplanting by the Greiner method, nothing suits us better than the true Prizetaker; but we can not depend upon the open market for the seed, and steer clear of disappointment. We now have it grown by private growers so we know what we are using. For sowing in open ground by the ordinary method, we think the true Yellow Globe Danvers is as good as any. In transplanting we make the rows 12 inches apart, and set the plants four inches apart in the row. One acre will thus take 130,000 plants, and it is possible to make them average half a pound each, which is over 1000 bushels, and at the time of year at which they mature they should net the grower a dollar a bushel.

If we sow the seed where the crop is to grow, by the usual method, we much prefer to keep them in hills one foot apart each way, leaving from six to ten plants in a hill. The hand work in weeding is very much less than where the plants are scattered in a continuous row. In this manner small plots may readily be planted by hand, marking the ground both ways with lines 12 inches apart, and placing a pinch of seed with the thumb and finger at each intersection. The Planet Jr. people have recently placed a hill-dropping drill on the market, for this purpose. It is really surprising to see what a hill of onions will grow by this method, wedging and crowding themselves in until some are actually raised several inches from the ground.

This season we sowed about an acre thickly in drills for the purpose of producing sets to keep over for spring planting, but did not use quite enough seed, consequently many of them grew too large for sets, yet small for market onions. These did not net us in market, late in season, over 40 cts. per bushel, while large bulbs, marketed a month earlier, readily brought \$1.10. This illustrates the difference between good and poor management, and emphasizes the importance of our rule number two, above stated. ISAAC F. TILLINGHAST.

La Plume, Pa., Jan. 15.

[Thanks, friend T. I believe I can fully indorse every point you make—that is, so far as my experience goes with onions, unless it is that I have not as yet had very much success with commercial fertilizers.]

CHIVES.

Mr. Root:—I send you some chives by mail to-day. The Germans use them for borders around beds in the garden, to hold the dirt. They are very ornamental when in bloom, and very much resemble a bed of pinks. They are used with lettuce and in soups, about the same as garlic, but, are much milder in flavor. The

bees swarm over the blossoms when in bloom, but I fear the honey would not be of very high quality. You ask in a late number of GLEANINGS if it is an onion. I do not know. However, it must be related to the onion.

Lintin, Ind., Jan. 10. JOSIAH GILLILAND.

[Thanks for your suggestion, friend G. Since I called for information about chives, I notice that a number of our seed catalogues advertise them.]

GARDENING IN THE MIDDLE OF FEBRUARY.

If you have glass, you can do a great lot in the way of gardening this month. Early beets and early cabbage should be sown at once; also cauliflower, celery, corn salad, cress, lettuce, onions for transplanting, and onion-sets; American Wonder peas, peppers; radishes, Scarlet Globe and Early Frame; spinach and tomatoes. If you have no glass you can make a hot-bed and cover it with cotton cloth, on the plan given in the tomato book. The great trouble with the cloth is from the heavy snows; but if your rafters support the cloth, say every 3 feet, and you sew curtain-rings to the ends, to be hooked over nails, the cloth will stand a considerable fall of snow. Fastening the ends is an excellent thing to prevent cold winds from flopping the cloth. Better not try any other way of using cloth than the plan given in the tomato book. It must be made to roll up on a heavy pole, or else the wind will make havoc. Cloth fastened to frames is only a bother and disappointment. The wind will blow your work all to pieces until you will wish you had never thought of gardening.

GARDENING IN THE OPEN AIR IN FEBRUARY.

If you feel like it, and wish to get ahead, you can often do considerable without any cloth or frames. Select a warm locality, south of buildings or high board fences; if there are also buildings or high board fences so as to cut off the west wind, without cutting off too much of the sun, it will do better still. Sheltered places between the hills, or close to heavy timber—the latter, I believe, is best of all—will often give a splendid spot for early gardens. The ground needs to be tremendously rich. Ridge it up so as to dry off quickly, and so the snow will melt off quickly; then as soon as the top of the ridge is fine enough to pulverize and rake, work it down smooth. First put in your American Wonder or Alaska peas; next, lettuce and radishes; a little later, early-cabbage seed; then beets and spinach; onion-sets; potato onions. multiplier onions, etc., can be put in safely on top of these ridges; and, finally, black onion seed. Sometimes these things will come up and afterward be injured by frost, without protection. But this rarely happens. Such stuff will stand ever so much more in the early spring than it will in the fall. Somehow it seems to know that warm days are ahead.

Since apples are so scarce, there is going to be an unusual inducement for starting pie-plant; and this will grow as well, or even better, in a dark cellar than in a light place. It will grow slowly in almost any ordinary cellar; but if there is a chimney that is just slightly warm, down near the ground, or even if there is a cooking stove right on the floor above, it will give you an excellent chance to start rhubarb if the bed be made on the cellar bottom right under the cooking-stove. Take up great big roots, dirt and all, any time when the ground is not frozen. Pack them close together in a bed on the cellar-bottom. Fill in around them with damp manure or rich dirt, and have a few

inches of dirt right over the crowns. Rhubarb-roots will make a start, toward spring, with the least bit of encouragement. You can get early asparagus in the same way, and we get 40 cts. per lb. for all we can produce in this way. Pie-plant ought to bring half as much this season.



PLANET JR. CULTIVATORS.

We have a supply of 1894 catalogues of Planet Jr. implements, which we shall be pleased to mail, on request, to those interested, together with our net price sheet, giving prices at which we can supply these goods, and ship direct from factory in Philadelphia, Pa.

SWEET (OR BOKHARA) CLOVER SEED.

We call the attention of our readers to the article in last number, on sweet clover, by H. R. Boardman, one of Ohio's leading bee-keepers and honey-producers. We have secured from Mr. Boardman a choice lot of seed of this clover he finds so valuable not only as a pasture for bees, but for stock also. The seed is hulled, and of extra fine quality. We offer it at 25c per lb., postpaid; by freight or express with other goods, 15c per lb.; 10 lbs., \$1.50; 25 lbs. or more, 12c.

SPECIAL SECTIONS AT SPECIAL PRICES.

In addition to the several lots of special sections listed in this department last issue, we would say that Joseph Nysewander, of Des Moines, Ia., has in stock, of our 1893 manufacture, 10,000 No. 1 white sections, mostly 1½, that he will sell at \$2.50 per 100; also about 30,000 No. 1 cream, 7 to foot and 1½, that he offers at \$2.00 per 100. This is a small stock for that point, and those who wish to avail themselves of these prices must apply early. Polished sections and other goods at our usual prices.

CALIFORNIA WHITE-SAGE HONEY.

If we did not get the car of Mercer's honey for which we were planning, we have samples of a lot equally good, now in Chicago, of which we shall have some in stock here also, very soon. We can furnish it f. o. b., either place, in 60-lb. cans, 2 in a case, at 7½c per lb.; in lots of 4 cases or more, at 7c. Samples mailed for 8 cents, to pay for mailing-package and postage. Choice white comb honey, in 1-lb. sections, 10-lb. lots, 15c per lb.; fair, 13c. Extracted clover and basswood honey, in kegs, at 7½c; in 60-lb. cans, 2 in a case, 8c.

WAX ADVANCED 2 CENTS A POUND.

The wax-market has shown a decided improvement in prices, so that we quote an advance of 2c per lb. over the prices which have ruled for several months. Until further notice we will pay 23c cash or 26c in trade for average wax delivered here. Selling price will be 30c for refined wax. We make no advance in price of comb foundation, but, on the contrary, we reduce the price of extra thin surplus foundation 5c per lb., making it only 5c per lb. more than thin surplus, instead of 10c, as formerly. This reduction is made at the suggestion of Chas. Dadant & Son, who make a like reduction.

SPRAY PUMPS AND SPRINKLERS.

Although it is early yet in most places to use spray-pumps, it is not too early for those in need of these implements to be looking about for the best and most efficient pumps at the best prices. We ask your attention to the line we offer, which you will find on the two inside cover pages of this number. The Myers pumps, which we have sold for the past two seasons, are the best pumps on the market at any price, so far as we know; yet the price is much lower than such goods are generally sold at. They have a new can-pump this year, which is very convenient. See pages referred to for further particulars; and if you desire still further particulars, send to us for Myers' eight-page spray-pump circular.

*I have had lettuce and radishes come up right in the open ground, in the month of February, without any protection whatever.

SECONDS IN RUBBER GLOVES.

We have secured 6 doz. of men's sizes (10, 11, and 12) rubber gloves in seconds that we offer, while they last, at half regular price—75c a pair, postpaid. For handling bees, and most purposes where such gloves are used, they will answer as well as firsts, being soft and flexible new goods, tan color, with slight defects, such as blisters, etc.

TEN PER CENT DISCOUNT ON PERFORATED ZINC.

After our list of prices was made up for this year we received notice of a reduction in the price of sheet zinc. Instead of making any change in list prices we will, until further notice, give to all customers 10 per cent discount from our list prices on our make of perforated zinc, in sheets and strips; also on all honey-boards, as listed on page 13 of our catalogue.

PRICES TO DEALERS AND SPECIAL CATALOGUES.

We have been delayed in mailing our terms to dealers till just before this number is mailed. If any of our readers are dealers in bee-keepers' supplies, and do not receive terms from us by the time they get this, or soon after, we shall be pleased to hear from them. If interested we shall be pleased to send you samples of our polished sections and comb foundation; also our special dealers' catalogue complete, ready for your use by printing your name on the cover.

NEW MACHINERY FOR MAKING LARGE EXTRACTORS.

In order to facilitate the manufacture of large 4 and 6 frame honey-extractors, so many of which seem to be required, we have purchased about \$200 worth of large timers' machines, and are now equipped for making large cans in the neatest and most approved manner. Bear in mind, in this connection, that we secured on the Cowan extractor the award honorable at the World's Columbian Exposition, and, I believe, the only award given to a honey-extractor.

HONEY MARKET.

The hard times are having their depressing effect on the honey market, as well as in other lines. We are daily in receipt of offers from parties wishing us to take their honey. Some are becoming dissatisfied with the slow returns on honey sent on commission to commission men, and desire to place it elsewhere. From all reports received, almost all the markets seems to be dull and demand light. This seems to be due to the fact that honey is more or less a luxury, and, during the hard times we have been having, is bought more sparingly than it is in better times. We hope, in the interest of all parties, for an improvement in general business.

EXTRA POLISHED SECTIONS.

Orders for these sections come at such a pace that we are unable as yet to get much stock ahead for the time not far distant when the demand is more lively and orders more numerous. We are stocking quite a number of dealers, some of whom have heretofore handled other makes. We consider this the best evidence of the superiority of our goods, notwithstanding the claims which some make regarding their own. One other thing regarding the way our sections are put up is worth considering. We use a slatted crate, similar to our bushel box, but holding about 1½ bushels level full, which is worth 25 cents about almost any home, for handling and storing roots and vegetables. A package of 100 regular 1-lb. sections, 4¾ x 1½, ready for shipment, weighs just 60 lbs., which is 20 lbs. less than they used to be several years ago. This reduction in weight effects quite a saving in freight, especially on long-distance shipments.

ROOT'S HOME REPAIRING OUTFIT.

We call the attention of our readers to the advertisement of this outfit in another column. It has been entirely remodeled, and is now offered in three combinations (see advertisement). In country districts, removed from repair shops, there ought to be one of these outfits in every neighborhood, if not in every home; and even in towns and villages you will effect quite a saving in repair-bills, as well as furnishing the boys with useful employment. We desire to say, in this connection, that the firm of Root Bros. who make these outfits, have no connection, except in a business way, with A. I. Root, and are not even relatives. We say this because a good many seem to confuse the two, thinking it is all in the same business, but under separate names. We will

say further, that Root Bros. are the originators of the Household Repairing Outfit, and it now has numerous imitations. They did not get their outfit patented or copyrighted, and hence have no legal grounds for action against their imitators. Being the originators they have moral grounds to support and patronage, for the other fellows have stolen their idea just as truly as though they had had it protected by a patent or copyright. As we furnish Root Bros. with a good deal of material, we like to take pay in trade; we can, therefore, make the same prices, both at retail and to the agents, that the manufacturers do. We shall be pleased to send circular, with full description; also terms to agents.

HARD-TIME PRICES.

We receive quite a number of letters from customers asking for lower prices on our goods, in view of the hard times and lower prices that are ruling in many lines of goods at the present time. We regret that we can not accede to these requests, for various reasons. In the first place, the margin on our goods is always small. If it were as large as it has been in some other lines we could better afford a reduction. The material entering into the manufacture of our goods has not declined any; and whenever it has we have made a corresponding reduction in price, as in the case of zinc in this issue. Lumber, which is the chief thing used in hives, etc., has advanced in price rather than declined; yet we have made no advance in our price, but work on a little smaller margin. The quality of our goods has been so much improved during the past year or two that, at the same price, they are worth much more in many cases than they were several years ago. Taking all things into consideration we are already making hardtime prices.

We could prove, by plenty of testimonials from reliable sources, that no bee-keepers' supplies surpass ours in quality and workmanship; and, notwithstanding the claims of some other manufacturers, we invite a comparison of goods and an impartial judgment.

PREMIUM GEM PEAS.

The peas we sold last season for American Wonders are no doubt Premium Gems, although we did not discover it till the present year; but the peas gave such good satisfaction nobody has as yet asked for damages. If any of our readers would still like some of the same kind they had last year, they can have them for half-pint, 5c; peck, \$1.00; bushel, \$3.50. This, you will notice, is just half the price of American Wonders at the present time. If wanted by mail, add at the rate of 15c per quart for postage.

ONION SEED \$1.00 PER LB. DELIVERED FREE AT YOUR POSTOFFICE.

We have the new onion seed, mentioned on page 111, in stock, and it looks very fair, but we have not had time to give it a test yet. I have no doubt it will give good satisfaction. The kinds offered at this very low price are Extra Early Red, Large Red Wethersfield, and Yellow Globe Danvers. Price 15 cts. per oz.; 40 cts. per ¼ lb.; \$1.10 per lb., or 10 lbs. for \$10.00. And the above low prices also include delivery at your nearest postoffice. The 10 lbs. may be made up of one kind or all kinds, as you choose.

COLD-FRAME CABBAGE AND LETTUCE PLANTS.

We have splendid cold-frame Wakefield cabbage-plants—the best we ever had in the month of February. Price 10c for 10; 75c per 100. Add 5c for 10 or 25c per 100 if wanted by mail. Nice lettuce-plants, 5c for 10; 40c per 100. If wanted by mail, the postage will be the same as for cabbage-plants. We can send out strawberry-plants the greater part of the time in February, if anybody wants them. For full particulars in regard to all these things, see our new seed-catalogue, which we are watching for chances to mail to anybody who wants one. Please notice our very low prices on Egyptian onion-sets and white multiplier onions.

LIVINGSTON'S BUCKEYE STATE TOMATO.

We did not intend to introduce this tomato into our list when our catalogue was put out; but the boys who gathered the tomatoes last year insisted so strongly that the Buckeye State is away ahead of any thing else ever offered in the way of a large tomato, we have planted a large lot of seeds already; and if we teach what we practice we ought in justice to offer it for sale. The plant is a wonderfully strong

and healthy grower. The tomatoes are as large as the Ignatum or Mikado, and as handsome as the Beauty. In fact, I do not believe I ever saw a bad-shaped one; and even though they are so large, they seem to be about as many to a vine as of any other kind. The only fault we have ever heard in regard to it, is that it is rather soft for shipping long distances. As ours are carried direct to our customers as soon as they are picked, this does not matter much for our trade. I would, however, recommend that tomatoes be sold in baskets holding not more than a peck; and for our fancy grade we use only new clean *half-peck* baskets. I think every one of our readers should have at least a 5-cent packet of Buckeye State tomato seed. As it is quite new the prices are necessarily rather high. Per $\frac{1}{2}$ oz., 30 cts.; ounce, 50 cts.; $\frac{1}{4}$ lb., \$1.60; 1 lb., \$5.25. All postpaid.

EARLY RUBY TOMATO.

Oh dear me! I don't see but we shall have to put still another tomato in our list. Last season we had some choice stock seed of Early Ruby, saved by Christian Weckesser, of Niagara Falls, N. Y., and it was so much superior to the Early Ruby that we had of Peter Henderson that I gave a favorable report on it, and now orders are coming in for the seeds. We did quite a large business in selling extra early plants last season. We put them out in plant-beds with the glass pretty high up from the soil, placing them about 7 inches apart, and the nice little plants actually blossomed right in the seed-bed. Yes, some of them even had small green tomatoes on before they were transplanted. We set them out in the field with the tomatoes on, many of them in full bloom, and they went right along and produced not only the earliest tomatoes, but they were of very much better shape than any Early Rubes we ever had before. We have succeeded in getting from friend Weckesser just 3 lbs. of the same kind of seed; and you can have it, while it lasts, at 5c a packet, or 20c an ounce. We are going to plant a good-sized bed ourselves, this 12th day of February, in that little greenhouse across the way.

GREENHOUSE CONSTRUCTION.

This is a new book just from the press, by Prof. Taft, and published by the O. Judd Co. There are 208 pages and ever so many pictures—yes, there are over 100, and I think the book will save many times its cost to any one who has very much to do with greenhouses, hot-beds, and cold-frames. Prof. Taft was appointed by the Michigan Agricultural College to superintend building some greenhouses for experimental work, and he has also had years of experience in this line elsewhere. As nearly as we can see, the book covers every thing up to the present time. For instance, the use of the putty-bulb has been a big step over the old-fashioned way of setting glass. Well, this book tells us that, by tying a little camel-hair pencil to the nozzle of the putty-bulb, this pencil or brush will make the liquid putty go down into the joint and smooth it down, making a much better job. The different ways of setting the glass are fully considered, and illustrated with numerous excellent cuts. The matter of heating by hot water and steam is thoroughly gone over. The angle at which the glass should be placed to the sun, for the different purposes for which greenhouses are used, is also made very plain. There is not much said about the matter of warming houses and hot-beds by condensed steam; but I do find just the following sentence bearing on the subject. After describing the plan of having a 1 $\frac{1}{4}$ -inch steam-pipe carried inside of a 4-inch drain tile, he adds: "When exhaust steam is at hand, it can be used without the steam-pipe by merely discharging it into the tile." It seems to me the above is giving but very little space to a matter which promises to be of much importance. You may remember I have considered the subject of supporting a family on a quarter of an acre by having this quarter-acre covered with glass—that is, cold-frames and sash. A diagram of the same arrangement is given in the new book. Some of the friends may think we are having a good many books devoted to this matter of gardening under glass. Greiner's book, however, was written by a practical gardener, and deals largely with the crops that are to be raised under glass. This book, however, treats the matter mostly from a scientific point of view—tells how the most effective houses can be built for the different purposes for which they are desired; and it gives clear and plain reasons for its suggestions. I consider the book a

valuable contribution to our present literature. The price is \$1.50. We can mail it from here if desired.

OUR CHEAP SPECTACLES AND EYE-GLASSES.

For a long time I have been thinking I must make mention of these little comforts to old age—especially the eye-glasses. I am getting now to where an eye-glass is almost as much a necessity as the air I breathe. May be that is a little extravagant, after all; but, never mind. When I am around the factory, going through the office, or even the green-houses, unless I can have a pencil and glasses at my fingers' ends I am like a fish out of water. In fact, I can not do any thing; and nothing wears on my nerves more than to feel in every one of my pockets for either pencil or glasses, and not find any; and, therefore, I get a nice pencil and cut it into four pieces, and put a piece in each pocket. Then I have cheap ten-cent eye-glasses—enough so I can have a pair in almost every pocket. Sometimes they all get into one pocket in a heap; and then if I throw off my overcoat I sometimes find myself down in the greenhouse, without any glasses, and my overcoat containing them all upstairs, hanging on its peg. By the way, the handiest place to me, for both pencil and glasses, is my right-hand vest pocket—that is, in the summer time, when my coat is off. When my coat is on and buttoned up, the next best place is the small right-hand pocket in my coat; with the overcoat on, I use the same pocket in the overcoat, the one often called the "ticket-pocket." Thus equipped I get along pretty well. I can not afford to be hampered with a case for an eye-glass, because it takes too much of my time. As a consequence, the glasses get scratched after a while, especially when I am out in the garden and get gravel in my pocket with the glasses. But as the nose-glasses I use cost only 10 cts., it is much cheaper to get a new pair often than to fuss with cases.

Now in regard to the quality of these ten-cent glasses. I have some gold-bowed ones for Sunday, that cost between five and ten dollars; but really I do not find them to be much if any better than the ten-cent ones I am using while I dictate this. It seems to me it is a shame to keep the prices up on a thing that needs to be so constantly used, by rich and poor alike, as nose-glasses and spectacles. We buy them in large lots, so they cost us only from 6 to 8 cts. a pair; and I am sure that dealers might do nicely in selling them at 10 cts., as we do. If they can not do that, let them charge 15. When I am away from home, and want a cheap nose-glass because mine got left, I always have to pay 25 cts., and sometimes 40 or 50. Why do not more people go into business, with such a desire to do good, and accommodate, that they can afford to work for low prices? My opinion is, they would make more in the end. Here is what a good friend away off in California has to say in regard to our cheap spectacles:

FRIEND ROOT:—I should like to confirm your statement, made some time ago, as to the value of those 10 cent glasses. I broke mine, and it would cost 25 or 35 cts. to get them mended. A new pair could not be had here for less than two dollars, so our jeweler told me. I concluded to write to you for a pair each of 10 and 25 cent glasses of different numbers. They soon came, and the 10-cent ones were exactly right—No. 16, the others had no number, and the paper has to come nearer, but they will do. Now, I have, during the past ten years, had glasses of all kinds and prices, up to ten dollars a set, and I can not see but these are as good as the best. This is the second night in a row on fine print.

LOS GATOS, CAL., OCT. 22.

ISAAC B. RUMFORD.

Ernest here suggests that, if you would save your eyes, you must have a good clear light. Every little while I feel like shaking people because they will sit down by a dirty lamp, with a greasy, dusty chimney, and without any cheap shade at all to throw the light and concentrate it on the print, and thus undertake to read. You may remember what I said about getting a nice bright clean lantern when I was off in the night, on the way to a temperance meeting. Well, it does seem to me as if I could pick out a Christian home by simply getting a glimpse of the lamp and lamp-chimney that light up said home.

By some error our nose-glasses (which I use altogether) never get into our catalogues, although we have had quite a sale on them by noticing them editorially. They are 10 cts. each. If wanted by mail, add 3 cts. additional for packing and postage. If you want a case to put them in, which is by far the better way when they are to be sent by mail, add 5 cts. more for the case. For prices on specs, both wholesale and retail, see our regular catalogue, 10 and 25 cent counters.

GOLDEN QUEENS

From Texas. My bees can not be surpassed for business, beauty, and gentleness. Safe arrival and satisfaction guaranteed. Untested queens—March, April, and May—\$1 each. 150 fine Tested Queens for early orders, \$1.50 each. Order early. Send for price list.

J. D. GIVENS, Box 3, Lisbon, Tex.

In responding to this advertisement mention GLEANINGS.

A BARGAIN.

25 extra fine S. C. Brown Leghorn cocks for sale at \$1.00 each. These birds have been raised the past season from choice stock. Satisfaction guaranteed.

Reference, A. I. Root.

LEININGER BROS., Ft. Jennings, O.

"TROT 'EM OUT!"

I challenge any one to show up a strain of bees that are superior to my *Golden Italians*. They have excelled all competitors by practical test. Gentle, industrious, good comb-builders, enter the sections readily, are not inclined to swarm, and are perfect beauties. Descriptive circular free. Sections, \$2, per M. Dovetailed hives way down.

CHAS. D. DUVALL, Spencerville, Md.

Please mention this paper.

For Sale, 125 Bushels Freeman Potatoes.

Grown from Wm. Henry Maule's seed, at the following prices: two-bushel sack, \$4.25; one bu., \$2.25; ½ bu., \$1.25; 1 peck, 75c; ¼ peck, 40c. Would exchange Freemans for a New Model garden seed-drill.

H. O. McELHANY,

Cedar Rapids, Linn Co., Iowa.

TREES AND PLANTS.

UPON our 250 acres of nursery we have every class of hardy Trees and Plants; Fruit, Ornamental, Nut and Flowering. Mary and Henry Ward Beecher Strawberries and Lovett's Best Blackberry are among the most valuable novelties. In our catalogues named below, which are the most complete, comprehensive and elaborate published by any nursery establishment in the world; all are accurately described and offered at one-half the price of tree agents.

LOVETT'S GUIDE TO FRUIT CULTURE tells all about fruits, their merits and defects; how to plant, prune, cultivate, etc. Richly illustrated. Several colored plates. Price 10c.

LOVETT'S MANUAL OF ORNAMENTAL TREES AND PLANTS is an authoritative as well as instructive; a model of excellence in printing and illustration. Gives points and plans for ornamental planting. Price, with colored plates, 15 cents.

Established 40 years. We successfully ship to all parts of the World.

All who order either of the above and name this paper will receive an ounce of Flower Seeds free.

J. T. LOVETT CO.

LITTLE SILVER,

N. J.

In writing advertisers please mention this paper.

3 6db

DOVETAILED HIVES, SIMPLICITY HIVES,

SECTIONS, EXTRACTORS, ETC.

FULL LINE OF

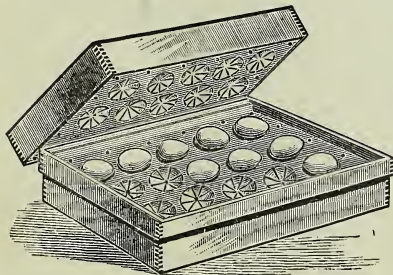
BEE-KEEPERS' SUPPLIES.

60-PAGE CATALOGUE.

11fdb

J. M. JENKINS, WETUMPKA, ALABAMA.

In responding to this advertisement mention GLEANINGS.



Costellow's Egg-Box.

This is an invention of great value to poultrymen in general, and to those who ship eggs for hatching in particular. The box is complete in itself, nothing in the way of packing being required. It is only necessary to place the eggs in the box, and fasten the cover down; they are securely held in place by light springs, which allow no play in any direction, but which hold them suspended in the center of the box, where they are secure from all jar, thumping, or breakage.

At a recent poultry show in Cleveland, O., one of the boxes was filled with eggs and tossed around the room and thrown to the floor; and, on opening, not an egg was broken.

The springs are so constructed that they will hold with equal security and ease any size of hen's egg. The single box will successfully carry any number of eggs from one to fifteen, and the double box any number from one to thirty. The cover is secured by metal fastenings turning the box over every few days, eggs in it will keep sound and good for six months or more.

PRICES.

	Sample.	Per doz.	Per 100.
15-egg box.....	\$ 25	\$1 80	\$12 50
30-egg box.....	35	3 00	20 00

It is lighter than any other package that you can use with equal safety, as well as being cheaper. The box weighs only 1¼ lbs., and the 30 box 2¼ lbs.

A. I. ROOT, MEDINA, OHIO.